

# COMPUTERWORLD

## MAP/TOP to get better standards fit

BY ELISABETH HORWITT  
CW STAFF

After remaining frozen for two years, MAP/TOP 3.0 is due to be thawed next spring and freshened up with some of the latest advances in standards-based networking, the North American MAP/TOP Users Group announced recently.

Among the more notable enhancements that will be incorporated into the 1991 MAP/TOP 3.0 supplement are Integrated Services Digital Network and 10Base-T support for Technical Office Protocol and the long-awaited fiber-based version of the 802.4 token-bus protocol. Manufacturing Automation Protocol and TOP are user-defined subsets of the Open Systems Interconnect standard, with MAP targeting the local factory networking environment and TOP addressing the office and business environment (see story page 47).

The supplement will help to align MAP and TOP protocols.

Continued on page 16

### Catch-up time

Manufacturing Automation Protocol (MAP) has lagged behind other technologies on the factory floor.



Source: Advanced Manufacturing Research  
CW Chart: Paul Mark

## Judge kills Dbase copyright

Decision clears way for clone makers to invade Ashton-Tate turf

BY JAMES DALY  
CW STAFF

In a move that could signal the beginning of a radical opening up of the database software market, a federal judge has ruled that Ashton-Tate Corp.'s original copyright for its popular line of Dbase software applications is invalid.

The ruling by U.S. District Judge Terrence J. Hatter Jr. came at the culmination of a drawn-out copyright infringement suit that Ashton-Tate had brought against Fox Software, Inc. for allegedly duplicating the appearance of the Dbase III Plus

package. The ruling could open the Dbase market to competitors and make a wider variety of low-cost options available to users. "A major drawback with Dbase is its high price," said Rocco Esposito, personal computer coordinator at Maidenform, Inc. in Bayonne, N.J., which uses Dbase-compatible software.

### Neglected to disclose

In dismissing the 2-year-old case, Hatter ruled that when Ashton-Tate filed for its original Dbase copyright, it neglected to disclose that the program was a derivative of the Jet Propulsion

Laboratories Document Information System, a public-domain application developed at the Jet Propulsion Laboratories in Pasadena, Calif.

"As a result of its inequitable conduct," Hatter declared the Dbase copyrights invalid.

While developers have hailed the move as an opportunity to open up the database market, Ashton-Tate President William Lyons said the company had no inkling the case would blow up in its face and would immediately ask Hatter to reconsider. "We're surprised and alarmed because we never got to the

Continued on page 36

### IN DEPTH: JOHNSON WAX

## Playing 'Skill Connection' with IS

BY JOANIE M. WEXLER  
CW STAFF

The 400-member worldwide information systems staff at S. C. Johnson & Son, Inc. is holding its head high these days. It has re-engineered its *modus operandi* with a system that is now serving as a model for the entire firm.

Traditionally, the strategic role of IS has meant providing users in such business areas as sales, marketing and manufacturing with quick access to corporate resources that allow them to make better decisions faster. However, the firm, commonly known as Johnson Wax, has decided that IS employees them-



Lemmygel heads IS skills development

selves are strategic resources. It has developed a "skills inventory" database application to match individuals' expertise with the projects that suit them best.

Dubbed Proficore, the database system was built around Information Builders, Inc.'s Focus and was designed by Johnson's Information Services Group to provide quick, analytical access to the human resources it needs.

The project, spearheaded by Vice President and Chief Information Officer Laurence Burden and Director of IS Management Support Services Randy Lengyel, was based on more than a year's worth of interviews conducted with human resources and IS

Continued on page 63

## Failures pester portable PCs

BY RICHARD PASTORE  
and MICHAEL FITZGERALD  
CW STAFF

The first of Nestor's Zenith Data Systems Supersport portable computers died on Oct. 23, 1989. The screen turned black on the Intel Corp. 8088-

based unit. Since then, Nestor's 16 Supersports have failed a total of 31 times.

"Zenith would send me a replacement machine, and that would fail also," said Nestor, director of MIS at Summit Consulting, Inc. in Lakeland, Fla. He awaits an explanation from Zenith.

This is just one horror story of the world of portable computing, which frustrated users claim is rife with reliability problems, brand inconsistencies and exorbitant repair costs.



A high-ranking information systems official at a major federal agency using 1,500 Intel 80286-based Supersports said the machines have had several bad screens and defective hard drives. The agency said it was sending in so many units for repairs that its third-party maintenance firm complained it was losing money on the service contract.

NDC Technologies, Inc. almost lost a major customer because of chip failures and difficult setup procedures with its Prospeed 386-based portables.

The problems surfaced in "a

Continued on page 4

## 3Com to cut back software operations

Microsoft will take on LAN Manager control

BY PATRICIA KEEFE  
CW STAFF

3Com Corp. will bail out of the network operating system business next month. According to internal documents obtained by *Computerworld*, 3Com intends to sell the rights to its LAN Manager-based 3+Open software and license a raft of LAN Manager research and development efforts to longtime partner Microsoft Corp.

Knowledgeable sources indicated that the announcement will take place early next month.

3Com President Eric Benhamou also told an assembly of managers last week that 3Com will stop investing money in four areas: directory services, personal computer-based internetworking, the Maxxis Systems Network Architecture gateway family and various "nonessential aspects" of network management.

Managers were also told that if 3Com cannot find an investor or buyer by Jan. 15 for either Maxxis or the Communications Solutions, Inc. division that

Continued on page 8

## INSIDE

### Product Spotlight

There's a maze of client/server definition to navigate before you buy actual products. Page 59.

**The disgruntled staff**  
member who allegedly wrote and sent the Scores virus on its way through an EDS computer and eventually into NASA systems could face charges in a few weeks. Page 4.

**What lurks in the shadows?** Perhaps a new source of cash for software vendors and some clarification of the policies governing the use of a single copy of a program. Page 7.

6630\*\*\*\*\* 5-DIGIT 48106  
0010723080839609 0010100754  
0614  
UNIVERSITY MICROFILMS INT  
SERIAL PUBLICATIONS  
300 N ZEEB RD  
ANN ARBOR MI 48106

# IN THIS ISSUE

## NEWS

4 Dallas police track down the author of a contagious virus that has infected "Score" of government computers in the South.

6 Although its bell-ringing method of collection has been around for years, the Salvation Army's database is brand new.

10 Concerned corporate Macintosh users meet with Apple executives to voice integration concerns and other needs.

12 IS staff members at Amoco are being reassigned — organizationally, not physically — to business units, where profit/loss responsibility lies.

16 Fibronics is forbidden to participate in next year's Interop show for violating a nondisclosure agreement.

95 Analysis says if IBM's Officevision doesn't deliver something soon, frustrated users may give up on it.

95 D&B Software is putting customers in the limelight, promising increased service and executive visibility for the new year.

96 The former Houston 30 joins the Corporation for Open Systems and fields hundreds of membership inquiries from across the U.S.

## Quotable

"Frankly, it's embarrassing to be an expert on EDI and to forecast explosive growth year after year."

THOMAS P. COLBERG  
PRICE WATERHOUSE

On users' cautious acceptance of EDI. See story page 46.

## SYSTEMS & SOFTWARE

25 While DEC's software is more than adequate, its method of marketing leaves much to be desired, according to analysts.

## PCs & WORKSTATIONS

35 It doesn't matter to me: Although some Business-Land clients are concerned about the company's downward financial turn, others are saying, "No problem."

## NETWORKING

47 Supporters of the standard are concentrating their efforts on raising users' OSI consciousness level — all the way to the top of the corporate ladder.

## MANAGER'S JOURNAL

49 Although few executives remain unscathed during the IS career battle, many emerge healthier, happier, wiser — and wealthier.

## COMPUTER INDUSTRY

73 Slow and steady wins the race: Pictoretel's time has finally come as video-conferencing gains devotees.

## PRODUCT SPOTLIGHT

53 What's involved in purchasing tools for client/server.

## IN DEPTH

1 Johnson Wax invests in its IS people. By Joanie M. Wexler.

## DEPARTMENTS

- 8, 95 News Shorts
- 21 Advanced Technology
- 22 Editorial
- 52 Book Review
- 81 Computer Careers
- 87 Marketplace
- 91 Training
- 94 Stocks
- 96 Trends

# EXECUTIVE BRIEFING

■ Johnson Wax has successfully re-engineered several business functions with information technology — including the IS department itself. The \$2.5 billion manufacturer uses a "skills inventory" database that matches IS employees to appropriate projects — and saves money. The firm is also re-vamping its financial applications and using an expert system to cope with worldwide environmental regulations. Pages 1, 63.

■ Amoco's IS organization is the latest to push more responsibility out to business units. Five hundred of Amoco's 1,900-employee IS staff will report to business unit executives instead of to IS managers. However, Amoco remains committed to several centralized IS functions, including consolidated data centers. Page 12.

■ Laptop computers are rife with reliability weaknesses, brand inconsistencies and high repair costs. Analysts attribute the portable problems to vendor compromises between weight, cost and durability. Page 1.

■ An EPA study of radiation from VDTs and other sources recommends a wave of new studies on the potential health risks. A draft of the study concluded that there is enough of an "elevated risk" of a link between cancer and electromagnetic fields to justify more studies. Page 96.

■ A federal judge found Ashton-Tate's database copyright invalid because the original copyright application failed to acknowledge existing technology from which the Dbase software was derived. The ruling, which caused the dismissal of Ashton-Tate's 2-year-old suit against Fox Software, could open up the personal computer database market and set a precedent for other pending copyright cases. Page 1.

■ Data General founder Edson de Castro resigned from the company, but the move was seen as more symbolic of the end of an era than as an action that would have a major effect on the company. De Castro had been much less involved in daily operations than President and Chief Executive Officer Ronald Skates. DG continues to bet its future on the Avion line, which faces big hurdles in the brutally competitive workstation market. Page 97.

■ The so-called Houston 30 users alliance joined the Corporation for Open Systems. Officially known as the User Alliance for Open Systems, the group is one of a growing number within COS pushing to develop user standards for vendors. Page 96.

■ The high-tech holiday spirit is in full swing at The Salvation Army in Chicago. A Microsoft Works database helps the Salvation Army schedule bell-ringing Sentas and track donations at more than 650 "tuttle sites" in the Chicago area. Page 6.

■ What recession? A leading IS executive says his firm that demand for top IS talent is as strong as ever — as are the salaries it commands. Page 49.

■ The list of the IS field's "worst job seekers" and their blunders includes short-term thinkers, money-mongers and poor interviewees. Page 81.

■ Legal eye: IS managers need to keep on top of copyright and patent laws in the early stages of software development. These laws are becoming more stringent than ever, and the stakes are high. Page 87.

■ On-site this week: Operation Desert Shield officials are generally pleased with the success of a massive PC network that tracks equipment and materials for the operation. Page 48. At Alaska Airlines, integration of in-house capabilities and outside services such as System One has helped keep the growing Seattle-based carrier profitable for 18 years. Page 27. One of the world's most unusual expert systems tracks mushroom-growing afflictions such as "bacterial blotch" at the Mushroom Experimental Station in The Netherlands. Page 39.

## The 5th Wave



"I SAID I WANTED A NEW MONITOR FOR CHRISTMAS! MONITOR! MONITOR!"

# Introducing The Financial Software That's Behind America's Most Successful Companies.

From the canyons of Wall Street to the Sun Belt to Silicon Valley.

Wherever you find successful companies you'll find something else:

The Masterpiece® series of financial software.

It's the most advanced and integrated accounting solution ever developed. Across all of your major hardware platforms (IBM main-frame and midrange, Digital VAX, Unisys, and Data General) Masterpiece delivers a single, comprehensive, approach to all of your financial needs. An integrated series of high-performance Masterpiece modules address: General Ledger and Financial Reporting, Purchasing and Payables Management, Receivables and Credit Management, Fixed Asset Accounting, Order and Inventory Management, and Project and Labor Cost Tracking.

Because it's built on top of a relational foundation, Masterpiece delivers superior integration and performance. It's also easily tailored to your company's specifications and offers a unique custom reporting facility along with distillation, analysis, data manipulation and outstanding presentation tools.

Call 1-800-645-3003 for complete information on Masterpiece. Call today and learn the difference between software for accounting—and software for success.



CA's Computing Architecture For The 90s protects and enhances the value of every CA software solution.

**COMPUTER ASSOCIATES**

# Police set to nab virus author

Creator of the Scores virus is believed to be a former EDS employee

BY MICHAEL ALEXANDER  
CHICAGO

DALLAS — The Dallas Police Department is preparing to file charges within weeks against the reputed author of Scores, a highly infectious and destructive virus that attacks Apple Computer, Inc. Macintoshes. It will be one of the few instances where a computer virus author has been identified and prosecuted for releasing his creation, according to computer virus experts.

The suspect, who authorities did not name, is thought to be a former employee of Electronic Data Systems Corp. (EDS), because the virus was originally designed to attack two proprietary applications used exclusively by EDS. The infected programs caused computer systems to crash repeatedly.

The virus was written in late 1987 and released in February 1988, according to a number of

virus experts. It was quickly discovered and eradicated by EDS engineers within two weeks, according to Roger Still, a spokesman for EDS. The virus infected 20 to 25 machines but did little real damage, he added.

It is uncertain how, but the virus showed up on federal government computers in Washington, D.C., Maryland and Florida in April 1988. In Washington, the virus infected 200 Macintoshes at the National Aeronautics and Space Administration, as well as dozens of computers belonging to several other federal agencies and congressional offices. Computers at Apple's government sales office in Washington were also infected.

NASA officials asked Dallas police to gather evidence and file charges. Sgt. Gary White of the Dallas Police Department said, "They felt that because it started in Dallas, it therefore makes it our jurisdiction."

NASA conducted its own in-

vestigation into the incident and turned over the information to Dallas authorities, according to Frank Kasper, a special agent in NASA's Office of Inspector General. Kasper said that other "government agencies, private citizens and companies would like them to look into it locally, because the federal prosecutors decided that it would be a local problem." He declined to comment further on the case.

## Among the willing

EDS is not among those companies that are asking Dallas law enforcers to prosecute the case, Still said. However, the company is willing to cooperate in the investigation, he added.

Charges will probably be filed in mid-January or the first part of February, White said. "We're going back through the evidence, plus whatever else we can come up with, to see if it will fit local laws." The charges will be filed under the state's Harbors

## Computer Access statute.

Dallas police officials said they believe they have enough evidence to prosecute but added last week that they were gathering testimony from people and organizations who claim to have been hit by the virus in an attempt to catalog how widespread the virus has become and attach an estimate of damages.

"Once we go to court, we'll be trying to show that even though it started here, it went worldwide and that thousands of individuals and companies were affected," White said. The investigators will also attempt to affix a dollar loss to the damage because that would determine what a suitable penalty will be.

Dallas authorities said they expect the suspect to plead guilty when shown the evidence against him. They will probably seek a suspended sentence with community service and a public apology, White said.

"It will depend on the prosecutor who prosecutes the case, but 50 years in jail isn't going to accomplish anything," White said. "We would rather see the community get something back."

cases," said Paul Nelis, senior microcomputer specialist at the bank's North American operation.

Vendors have been reluctant to comment on these problems because few statistics are kept on portable repair rates.

A Compaq spokesman said only "a small percentage" of customers reported cracks, but added that the cases were not consistent with the kind of quality we think we should be providing. The company has switched to new materials and provided owners of older LTEs with a lifetime warranty.

A Zenith Data Systems spokesman claimed "an insignificant number" of Supersport 286 machines suffered video failures because of motherboard instabilities. The flaws were reportedly fixed as of Jan. 1, 1990, and Zenith doubled the one-year warranty on models made before that date.

When prodded, PC repairmen and analysts will cite particular brands that seem harder (and more pricey) than others — Toshiba America, Inc. and Compaq among them. But they caution that there is no best portable.

"They've all failed. They've all been in here. Nobody's exempt," said Dan Mazurek, service manager at Advanced Computer Repair Centers in Woburn, Mass.

Despite these complaints, there are many users who extol the rugged virtues of their units. The U.S. government recently purchased a number of off-the-shelf Zenith portables for use in Operation Desert Shield because of their durability.

## COMPUTERWORLD

### Editor in Chief

Bill Lefteris

Executive Editor

Paul Gillo

News Editor

Paul Berwick

Assistant News Editor

James Cassidy

Staff Editors

Clara Wills, Management

Donald Horvitz, Hardware

Patricia Adams, Telecommunications

Michael Alexander, Advanced Technology

Rebecca Johnston, Systems & Software

Neil Margolis, Industry

Marjorie Johnson, Systems & Software

Staff Writers

Julia Lynch

Carol Hildebrand

News Production Editor

Gary Byrne

Research Coordinator

Karen Berke

Features Editors

Glenn Feld

Joan Kasper

Staff Editor

Michael J. Sullivan-Trotter

Joseph Maguire

Michael J. Sullivan-Trotter

Marjorie Johnson

Donald H. Smith

Staff Writer

Alan J. Ryan

Associate Editor

James H. Kelly

Staff Writer

Joe Nuss

Staff Writer

John H. Smith

Staff Writer

John H. Smith

Staff Writer

John H. Smith

Staff Writer

John H. Smith

Staff Writer

John H. Smith

Staff Writer

John H. Smith

Staff Writer

John H. Smith

Staff Writer

John H. Smith

Staff Writer

John H. Smith

Staff Writer

John H. Smith

Staff Writer

John H. Smith

Staff Writer

John H. Smith

Staff Writer

John H. Smith

Staff Writer

John H. Smith

Staff Writer

John H. Smith

Staff Writer

John H. Smith

Staff Writer

John H. Smith

Staff Writer

John H. Smith

Staff Writer

John H. Smith

Staff Writer

John H. Smith

Staff Writer

John H. Smith

Staff Writer

## Portable PCs

FROM PAGE 1

significant number of machines," said Dick Nelson, vice president of systems at New York Life Insurance Co. In October, Nelson stopped placing orders for Prospecs, which had been New York Life's standard portable computer for its agency business. After one month of talks and reassessment, the firm

to 40% of its portfolios require fitting, estimated Jack Byndorp, Jockey's PC coordinator.

Even more disturbing is that unlike most desktop PCs, the portables often break down during their first year of service, Byndorp added.

Analysts attributed these problems to vendor compromises on weight, cost and durability. As the portable PC shrinks in size and grows in power, these design trade-offs will become even more agonizing.

"Anyone you try to make things lighter, [something else] suffers," said John Dunlap, vice president at Workgroup Technologies, Inc. in Hampton, N.H.

The new 386SX-based notebook PCs "are probably not as durable as they ought to be, judging from what I saw" at Comdex/Fall '90, said Will Fastie, editor of the "Fastie Report" in Baltimore.

Users of 20-pound arm busters cannot rest easy either, however sturdier the bigger portables may seem.

While some laptop PCs have held up well, "we found the Mac Portable to be a much more fragile piece of technology," said John Moritz, president at Workgroup, a portable-PC rental firm in Salem, Mass.

"Our records say [laptops] do fail more often than the desktops — probably at a 25% to 30% higher failure rate," said Thomas Ewing, vice president and as-



Laptops such as Zenith's Supersport shape up as being less reliable than desktop systems.

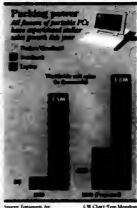
stant general manager at TRW Customer Service Division, a nationwide service organization in Fairfield, N.J.

Ewing said laptop problems were widely varied, and laptops take almost twice as long to repair as desktops.

Their proprietary construction makes parts for laptops two to three times more expensive than comparable desktop PC components.

For instance, fixing a distracting line down the center of a portable's gas plasma display can cost customers between \$1,000 and \$1,500.

"It's really ridiculous, and customers take it out on us," said Richard Allegretto, general manager of Data National Corp., a PC repair house in Boston. At Calaise Nationale de Credit Agricole, all 12 of its LTEs developed cracks. Worse, new cases obtained from Compaq Computer Corp. at no charge "produced exactly the same cracks, so there was no real point in continuing to replace the



Working with others in the Zenith Supersport line.

Source: Zenith Systems, Inc.

IBM Chart From Manufacturer

decided to resume its relationship with NEC.

According to some users, portables break more frequently than their cousins on the desktop. At Jockey International, Inc. in Kenosha, Wis., about 10% of the firm's installed desktop personal computers are being repaired at a given time. But 35%

### Editorial and Production Manager

Sharon Byers

Book Editors

Margaret McBride

Staff Editor

John H. Smith

Staff Editor

John H. Smith

Staff Editor

John H. Smith

Staff Editor

John H. Smith

Staff Editor

John H. Smith

Staff Editor

John H. Smith

Staff Editor

John H. Smith

Staff Editor

John H. Smith

Staff Editor

John H. Smith

Staff Editor

John H. Smith

Staff Editor

John H. Smith

Staff Editor

John H. Smith

Staff Editor

John H. Smith

Staff Editor

John H. Smith

Staff Editor

John H. Smith

Staff Editor

John H. Smith

# SYNCSORT. WHERE BUSINESS TURNS FIRST FOR SORTING EFFICIENCY.



Working in a competitive environment, your customers have chosen Syncsort the highest marks for reliability, efficiency, ease of installation, ease of use, technical support, and user education. Working in partnership with businesses of all sizes, Syncsort helps them get the fastest, most efficient sorts.

For increased productivity and greater savings, choose the sorting solution that the Fortune 100 turn to first...Syncsort.



**syncsort**  
INC.  
50 Tice Boulevard, Woodcliff Lake, NJ 07675  
**800-535-3355**

# AT&T/NCR make their stands

BY MICHAEL FITZGERALD  
OF STAFF

AT&T and NCR Corp. appeared to be settling into siege positions as AT&T's bid to take over the Dayton, Ohio-based computer manufacturer moved into its second week.

AT&T's hostile takeover bid, which started on Dec. 6 after the NCR board rejected a friendly merger, remains in place, and NCR executives continue to do what they can to keep the company independent. Late in the week, NCR's board rejected the \$90 per share hostile tender offer, calling it "grossly inadequate."

"Clearly, AT&T is attempting, for its own purposes, to take advantage of NCR's artificiality

and temporarily depressed stock price," NCR Chairman Charles E. Exley Jr. said in a written statement.

Meanwhile, AT&T said it still hopes to negotiate a settlement and announced that it had lined up a consortium of banks to fund its \$6.12 billion, all-cash takeover move. NCR filed suit in an Ohio court, asking for a judgment stating that NCR's shareholder rights plan is lawful.

Analysts are betting that if the deal goes through, it will be for more than \$90 per share.

"Anything can happen in this deal," said Byron Walker, credit analyst at Moody's Investor's Service. Walker said only one thing is certain: "[Exley] will make his return to stability as an owner. He believes in that and has

the wherewithal to do it."

Most analysts said NCR is not worth Exley's asking price of \$125 per share, and some said they think it was fairly valued at \$55. The market price last week held at just above \$90 per share. The New York Stock Exchange briefly suspended trading Wednesday on NCR's stock because of a news report about negotiations between NCR and potential "white knights."

In the meantime, doubts swirled about the merits of the deal.

**A quick deal benefits all** if AT&T's effort to take over NCR is lengthy, it will hurt both companies, no matter what the resolution, analysts said.

"Their competitors will lap at

their chops to see it not go through in a hurry, and people will legitimately have concerns, because NCR will be late with products," said Bob Vautrain, an analyst at Gartner Group/Info-pan in Santa Clara, Calif. "Both companies' competitors will step up on this and use it as a PUD [fear, uncertainty and doubt] factor against them."

However, if the merger is smooth and resolved quickly, NCR should not be thrown off its System 3000 stride, said David Card, midrange analyst at International Data Corp. in Framingham, Mass.

Then the deal should strengthen the position of the combined companies against Hewlett-Packard Co., IBM and Digital Equipment Corp. and fend off any ventures that Sun Microsystems, Inc. may make into commercial Unix.

Most analysts say they be-

lieve that AT&T will let NCR stay autonomous. "I kind of see this acquisition by AT&T as an attempt... to get out of the computer business," said David Schofield, an analyst at Duff & Phelps, Inc. in Chicago. With the acquisition, AT&T could immediately rid itself of its troubled computer division, while at the same time maintaining a presence in the computer market.

The way the financing shakes out could also affect the venture. Exley's asking price of \$125 per share would be paid with AT&T stock, while AT&T's current bid is an all cash one and will expire on Jan. 4.

Stock or cash makes a difference, said Barry Bosak, who follows NCR at Smith Barney, Harris, Upham & Co. in New York. A stock swap is more attractive to Exley because it reduces the capital gains tax incurred by a cash sale.

## AT&T customers not fazed by NCR threats

BY ELLIS BOOKER  
OF STAFF

NCR Corp. Chairman Charles E. Exley Jr. vowed to "tax" a number of AT&T computer products, should AT&T succeed with the hostile takeover attempt it launched two weeks ago, was not being taken seriously by AT&T customers last week.

Exley's threat painted a scenario in which the head of a company that loses a takeover battle could not only keep his job but also purge the victor's product lines.

AT&T would let NCR "pick and choose" what it wanted to retain from AT&T Computer Systems' product portfolio, Exley said. In a letter to Exley on Dec. 5, AT&T Chairman Robert E. Allen said he would want NCR senior management to run the merged operation.

**Vengeance is mine**  
If given such oversight, Exley has said he would quickly "orchestrate" the AT&T 386 minicomputer line, select the Open Systems Foundation's MVS over Open Look — AT&T's choice for graphical interfaces — and "tax" AT&T's Unix client approach and Tuxedo transaction monitoring system in favor of NCR's technology.

"They're both reputable companies, and I'd really be shocked if either walked away from their customers," said Frank Erblich, senior vice president at United Parcel Service, Inc. (UPS) in Greenwich, Conn.

UPS is a major customer of AT&T and NCR. Eighteen months ago, it signed a \$20 million purchase contract with

AT&T Computer Systems for personal computers, UPS also buys NCR terminals, scales and NCR Tower computers.

Several AT&T customers said they see the logic behind AT&T's interest in NCR, which also backs an open systems architecture and Unix. Some went so far as to advocate a merger.

"It signals [that AT&T] wants to be a big-time player in telecommunications, to be the preeminent provider of these services," said Steve Muzzo, chief executive officer at Wallmark, Inc. in West Lake Village, Calif. Wallmark last week announced it was engaged in a five-year, \$30 million deal with AT&T for a health information network linking insurance providers, employers and medical facilities.

Muzzo expressed little concern that his AT&T field service representatives — who have been on-site since October — may be reporting through Dayton soon. "It doesn't concern me... unless NCR changes the aggressive way AT&T has approached the market," he said.

However, Antrak's senior director of data center operations, David Hadrick, said he was uncomfortable with the level of service from AT&T and NCR. "The service and support on data processing equipment from both is not up to par with IBM," Hadrick said. "If it got any worse as the result of a merger, I'd be worried."

This year, Antrak signed a \$14 million purchase contract with AT&T to replace its terminals with AT&T brand, IBM-compatible PCs and controllers. Antrak also buys self-service ticketing machines from NCR.

## Database helps keep bells ringing

BY CAROL HILDEBRAND  
OF STAFF

Collecting coins in a kettle is a

pretty old-fashioned method of fund-raising, and the Salvation Army is a pretty old-fashioned organization. But the army's Greater Chicago area divisional headquarters is using the power of high tech to pull it out of the Norman Rockwell era when it comes to keeping track of its bell-ringers.

According to Don Eley, director of special efforts at the Chicago office, the logistics of coordinating the Christmas kettle event gave him the idea for putting the data on-line.

The Chicago area has about 650 kettle sites under the jurisdiction of 30 community "center" offices. Using Microsoft Works from Microsoft Corp., Eley created a database that tracks pertinent information for individual sites.



The Salvation Army is using a database to coordinate information from its collection sites.

## SDI information database available for commercial use

WASHINGTON, D.C. — The U.S. Department of Defense has established a database of information on technologies developed for the Strategic Defense Initiative (SDI) that has potential for commercial use. The database contains 1,400 unclassified, nonproprietary summaries of SDI spin-offs.

The database is available to any U.S. citizen or company that has signed an agreement with the Defense Logistics Agency.

According to the Pentagon's Strategic Defense Initiative Office (SDIO), commercial computer spin-offs from SDI have included optical supercomputers, computer-aided design and soft-

ware engineering tools and new computer security measures. For example, the SDIO said Odyssey Research Associates in Ithaca, N.Y., is testing work done for SDI to develop ways to permit computer security for networked computers to be controlled from any site.

The database contains pointers to other technology transfer databases and testing assistance programs provided by more than 600 federal, state and local agencies.

GARY ANTHERS

# Lotus seeks industry dialog on shadow copies

BY PATRICIA KEEFE  
CW STAFF

Should applications be licensed on a per user or per machine basis? Rocketing sales of laptop and home computers are pushing this question to the fore, especially given speculation that software developers are looking to the growing ranks of portable users to pump up flagging sales.

Thus, Lotus Development Corp., which is taking heat over its per-machine policy, is taking steps to spearhead an industry powwow that could provide a consensus on how to deal with so-called "shadow copies."

Although the effort is in the very early stages, analysts questioned last week whether this might constitute an antitrust violation.

"Shadow copies are a gigantic problem," said Lotus Chairman Jim Manzi, who added he has spoken informally in recent weeks with officials from both Microsoft Corp. and the Software Publishers Association (SPA) about working within the SPA, and possibly with customers, to "intelligently" resolve this issue and others.

For example, some users have questioned why they are allowed to license one copy of software, install it on one machine and have 10 people use it, yet one user cannot install one package on two machines for personal use.

Even the most vigilant personal computer managers can be overwhelmed by an installed base of hundreds and thousands of users running a mix of packages all sporting different use restrictions. "It's a record-keeping nightmare," one Midwest federal user asserted.

"It's a real can of worms," said Jeff Tarter, publisher of the "Soft Letter" newsletter. He maintained that the issue is not one of payment for corporate managers but rather a desire to provide users with a set of consistent rules. This is not possible today.

## Cumbersome procedures

As do many developers, Lotus requires users to purchase a separate copy of software for each machine. If a user wants to install Lotus' 1-2-3 on a second computer, it must initially be removed from the first computer — a cumbersome procedure that many users object to.

"It ticks off the user and doesn't create a lot of good will," said Nancy McSharry, an analyst at International Data Corp.'s Menlo Park, Calif., office.

In recent months, Lotus magazine has published several letters from readers complaining about the developer's policy. One user said he had decided against purchasing Lotus, while another was looking "very hard" at alternative software.

One such alternative comes from Borland International, Inc., which has effectively wielded its liberal licensing policy as a marketing tool. Borland's "no-nonsense" license compares software to a book. Users can make as many copies as they want, as long as the copies are for their personal use. This approach draws applause from users and analysts alike. "From a standpoint of customer relations, other vendors would do well to adopt Borland's approach," said Will Fastie, publisher of "The Fastie Report."

A software license buys a user the ability to access the software, a PC manager

at a major West Coast bank said. He added that it should not matter how the user uses the package, as long as there is no simultaneous use.

Microsoft falls in between. It allows copies under tightly defined circumstances, but these rules go out the window if the user can state that he uses one computer 80% of the time. Then the user is permitted to install copies on a second computer. But some users condemn this approach as wily-washy and too subject to interpretation.

As for the SPA, Director Ken Weach offered yet another twist. The SPA promotes awareness of software as protect-

ed intellectual property. It is leery of anything that encourages users to copy software. Weach said he leans toward charging users a minimal amount, perhaps \$50, for what he calls a laptop or home computer "extension."

## Not a good idea

Users and analysts generally turned a cold shoulder to the idea. "The idea is ridiculous; users won't do it," Fastie said.

However, David Courley, a Gartner Group, Inc. analyst, suggested that unless a portable is really a secondary machine, software companies may be justified in re-

quiring purchase of a second copy.

It is preferable to spending several hundred dollars, and it would work on an individual basis, said Dick Nelson, a vice president at New York Life Insurance Co. in New York. But he also said it would prove a bureaucratic nightmare for corporations. "I have 8,000 agents with laptops. I can't possibly administer that!"

Yet another option is the unlimited use site license. Nelson would prefer that route — but based on the number of users, not machines. A systems manager at a Fortune 1,000 retail concern said he has successfully negotiated site licenses. "Vendors are willing to negotiate, as long as [users] play straight. You have to guarantee no concurrent use and then police yourself internally," he said.



Maximize the Efficiency of Your Tape Library

## CLEAN UP WITH FATS AND FATAR

**FAST ANALYSIS OF TAPE SURFACES (FATS)** is a tape utility program which permits online tape certification, verification and erasure.

- FATS is designed to certify tapes where they will be used on the actual tape drives.
- FATS certifies scratch tapes and verifies that data files can be read.
- FATS supports high-speed data security erasure of tape data.
- FATS provides a permanent record of each tape tested in the form of comprehensive detail and summary reports.

**FAST ANALYSIS OF TAPE AND RECOVERY (FATAR)** is a tape utility program which analyzes and copies tapes, especially tapes with data checks or bad data.

FATAR is designed to:

- Read tapes, including multi-volume and/or multi-file tapes.
- Recover from I/O errors on tapes.
- Copy tapes, including multi-file and/or multi-volume tapes in one execution.
- Modify data on tape (while copying).
- Display and correct data check blocks on tape.
- Validate and correct the record format of files on tape (including variable spanned records like SMF).
- Convert ASCII data to EBCDIC, EBCDIC to ASCII.
- Copy tapes to a different label type or device type such as ANSI-to-IBM labels, or 6250 BPI to 3480 cartridge.
- Re-block tape files while copying.

For a FREE COPY of the  
FATS and FATAR REPORTS  
and a FREE 90 DAY TRIAL  
CALL (201) 890-7300

Available for  
VSI and all MVS systems

**INNOVATION<sup>®</sup>**  
DATA PROCESSING

CORPORATE HEADQUARTERS: 275 Paterson Avenue, Little Falls, New Jersey 07424 • (201) 890-7300

EUROPEAN  
OFFICES:

FRANCE  
01-47-69-15-15

GERMANY  
089-439-2053

NETHERLANDS  
0240-41650

UNITED KINGDOM  
081-205-1266

## NEWS SHORTS

### Beckman, Index move to OS/2

Beckman Information Systems, Inc. announced OS/2 versions of two re-engineering tools: Chapters for DBS and Chapters for PL/I. In September, the company announced an OS/2 version for Beckman Analyst, the process and logic modeling environment used by its re-engineering tools. At the same time, Index Technology Corp. said that the OS/2 version of its Excelsior database product will go out to early adopters some time this week.

### Dbase IV for DEC's VMS shipping

Ashen-Tate Corp. continued to target multivendor, multitasking platforms as it began shipping an edition of its Dbase IV Version 1.1 database application for Digital Equipment Corp.'s VMS operating environment. The product, which is being marketed and supported in the U.S. by DEC, will allow Dbase IV users to run the DEC-based application on a DEC VAX VMS system without modifying or recompiling code. DEC is offering introductory pricing of \$995 for single-user workstations and \$4,200 for a four-user license until March 31, 1991. In separate news, the company promoted President William Lyons to chief executive officer.

### New firm to target OOP

A group of software industry veterans, many recently departed from minicomputer maker Data General Corp., have banded together to form a new venture, dubbed Hyperdeck Corp. The new entry is being financed by Tokyo-based ASCII Corp., a Japanese systems and applications software vendor of the personal computer, workstation and server market. Hyperdeck will offer object-oriented software products in distributed local-area network environments. The software technology was purchased from DG, and under terms of the agreement, the DG Avion workstation will be one of the first development platforms for the new software.

### Apollo to crow: find other jobs

Plans to shrink its work force at the Apollo Systems Division of Hewlett-Packard Co., which is located in Chelmsford, Mass., HP told 120 hardware and software engineers to look for other jobs within the company. Some jobs will be available at the Chelmsford site, but most are expected to be at other locations. With that directive, HP has asked a total of more than 1,120 employees to look for another job this year, according to a spokeswoman. Of those, approximately 800 have secured other work within the company.

### The Leningrad stock exchange

The City of Leningrad signed a letter of intent with Englewood, N.J.-based Pricewaterhouse Consulting Group and New York-based Transvix, Inc. last week to create a highly automated stock and commodities exchange. Scheduled for completion in about one year, the system will be styled after the Nordex Scandinavian commodities exchange in London, which Transvix built, and centered on DEC Vaxstations, "assuming it is permissible and possible," Transvix Chairman Bjorn Wiken said. No details were given on how much the system will cost or how Leningrad will pay for it.

### Stratus strikes Seven-Eleven deal

Stratus Computer, Inc. last week announced a \$3.9 million deal with the Seven-Eleven Japan Co. in Tokyo, which will buy nine Stratus XA2000 systems to run its new store inventory management and merchandising system. Using what Stratus claims is the world's largest integrated Services Digital Network, Seven-Eleven, the largest convenience store chain and food retailer in Japan, will be collecting sales transactions from its 4,200 stores on the Stratus systems by June 1991. The entire project, including new hardware, software, networking equipment and terminals, is estimated at \$17 million during the next two years.

More news shorts on page 36

## Users to demand net software

BY JOANIE M. WEXLER  
OF STAFF

The deficit of applications optimized for Banyan Systems, Inc. Virtual Networking Software (Vines) and other networks could turn around if the efforts of a fledgling group of high-end user companies are successful.

About 25 large user companies — unofficially calling themselves the Enterprise Network Applications Consortium — met early this month to consider approaching software developers en masse to demand commercial availability of the networking applications they need.

The group included some of Banyan's largest users: Compaq Computer Corp.; Pacific Gas & Electric Co.; Pennsylvania Blue Shield; Nike, Inc.; U.S. Sprint Communications Co.; MCI Communications Corp.; and the Canadian National Defense.

### Considerable size

Members of the consortium said the group accounts for about 70,000 workstations and 2,500 servers running on Banyan networks. It plans to work with Banyan in driving the development of commercially available

applications that integrate with the Vines network operating system at all network levels. A Banyan spokesman said the vendor is behind the group's efforts all the way.

Art Beckman, manager of information technology services at Pacific Gas & Electric, currently spearheads the group. He pointed out that the theme of the consortium is to "get more applications for the networking world — period." He noted that "there is a special flavor for Banyan, because we're all large Banyan users." However, he said, because of a lack of networking standards in general, the issue reaches to anyone involved in enterprise-wide networking.

Beckman explained that the efficiency of applications tested to work on local-area networks does not necessarily translate into the enterprise network. "Often developers take a stand-alone application and turn it into an enterprise application, but on a LAN with only a few nodes," he said. "But with a scenario of 200 to 300 servers talking to each other at various speeds — real-life networking — a lot of applications aren't efficient throughout the entire organization."

"The application developers want input from us; we represent an opportunity for them," said Michael S. Kinsey, who represents Pennsylvania Blue Shield on its steering committee. "There are applications available that work in conjunction with Vines but are not Vines-integrated. I can't take a file right out of word processing and dump it directly into electronic mail. I want integration across all layers: I want to enter my password once — not three times — for all the functions I do."

**Cover up with third parties** Kinsey said that currently, his firm — which is installing Banyan as its enterprise networking scheme — is using third-party applications "to mask that inelegance to users."

Kinsey also noted that Pennsylvania Blue Shield would prefer not to do in-house development. "Every time Vines gets upgraded, we'll have to recode our applications — an application maintenance nightmare."

The consortium is slated to meet again in February to focus its charter, which is currently under construction by its steering committee.

## 3Com

FROM PAGE 1

supplies it, it will begin to "wind down" the SNA division.

Meanwhile, a marketing and engineering team has been directed to establish "an affordable network management solution."

During at least one internal meeting and throughout the documents, 3Com stressed that it will not abandon affected users. It has "forged an agreement [with Microsoft] that will protect 3Com's customers' and resellers' investment in LAN Manager while this transition occurs. Managers were told that Microsoft will modify LAN Manager to facilitate migration of 3+ and 3+ Open 1.X customers.

Although steps are being taken to ensure continued support and product migration, 3Com does risk losing customers who had been attracted to its one-stop shopping. "The network had 3Com's name on every piece; management figured it had to work together," said Matt Scholz, IS manager at the San Diego County Water Authority.

One user said he no longer knows what 3Com's business is. It is "disheartening," said Bob Saur, IS manager at Index Technology Corp., to see 3Com "bailing out" of networking. Having sold sole responsibility for LAN Manager development to Microsoft is expected to hasten the de-

velopment of a core LAN Manager product. "When we find ourselves [then] with a great [network operating system] platform, which threatens to displace users and customers who are confused as to where they should go to get LAN Manager solutions," 3Com officials said in the documentation.

The decision to halt further investments in LAN Manager allows 3Com to "turn [its] networking expertise more ag-

reou repeatedly cited poor return on LAN Manager investments, a source said.

Former 3Com Executive Vice President Les Deacand said the writing was on the wall last August when first-quarter figures showed that Distributed Systems Division sales were sinking. Benhamou "made it clear at the time that 3Com would be less involved with LAN Manager development," Deacand said.

IT IS "DISHEARTENING" to see 3Com "bailing out" of networking.

BOB SAUR  
INDEX TECHNOLOGY

gressively toward producing server, management and connectivity platforms and solutions — from a network operating system neutral stance," according to the documentation.

In short, the company intends to continue the shift in strategy it began earlier this year by moving away from work group and client/server technology toward providing the pieces required to connect and manage open, global data networks.

Last week, 3Com founder Robert Metcalfe said LAN Manager sales never generated more than 10% of 3Com's revenue. In fact, during the manager's meeting last week, Ben-

The deal will also relieve 3Com of its obligations under a contract with Microsoft that requires it to pay Microsoft license fees, regardless of how many copies of LAN Manager it sells, a source said.

The two vendors co-developed LAN Manager, but the upcoming consortium will wield the source code to Microsoft. In return, Microsoft will license the rights to three 3Com LAN Manager development efforts: X.500 services, Apple Computer, Inc. Macintosh connectivity and Novell, Inc. NetWare connectivity.

West Coast correspondent Jim Nash contributed to this story.





## Oracle sets client/server ODP performance record.

The new audited ORACLE® benchmarks show transaction-per-second (TPS) scores from 21 TPS with a 200 megabyte database on a PC, to 416 TPS on a mainframe with an 8 gigabyte database. These were industry-standard TPI tests independently certified by Codd & Date.\*

This scalable performance means ORACLE not only runs everywhere, it runs everywhere faster. Faster on a single machine. Faster in a client/server configuration. So no matter what system you choose, you get the best performance and lowest cost per transaction. No small concern to managers trying to squeeze the most out of MIS/DP budgets.

1-800-633-1071 Ext-8116

But don't just take our word for it. Call, and ask for the benchmark reports audited by Codd & Date. They certify the test results and give a full account of the testing methodology and system configurations. Just the thing for a little speed reading.

# ORACLE®

Software that runs on all your computers.

# Apple users voice Mac concerns

BY JOHANNA AMBROSIO  
CW STAFF

ORLANDO, Fla. — Corporate Macintosh users met last week to challenge Apple Computer, Inc. on issues ranging from service and support to how the Mac-

intosh fits into an enterprisewide computer network.

While users say they continue to be satisfied with the Macintosh as a personal productivity tool, conversation centered on networking, integration and whether Apple is doing enough

to help the Macintosh connect to mainframes and other environments. Some users voiced concern over whether they are doing the right thing by continuing their Macintosh investments.

"Users are saying that we're using the Macintosh strategical-

ly, and we want some recognition by Apple of that fact," said Mille Koss, an associate director at Harvard University in Cambridge, Mass. "It's more than just a PC now."

The forum for Koss and other large Macintosh users to voice their concerns was the fourth Managing Apple Computers in Information Systems (MACIS) conference. An independent

group formed in February 1989, MACIS is comprised of 120 member organizations, with a total of 200,000 Macintoshes installed. Each member has at least 100 Macintoshes.

The big question in any organization right now is how the Macintosh will work with AD/Cycle," said an IS staff member from a large Midwestern insurance firm, referring to IBM's architecture for computer-aided software engineering.

"Our executives are really concerned that OS/2 will have some kind of strategic advantage in the AD/Cycle environment," he said.

Even users who have thousands of Macintoshes installed as their primary workstation platforms are having some doubts. "I'm sneaking in a few PS/2s with Windows," said one director at a large services firm. "Even though our official platform is the Macintosh, I don't want to wake up one day and find that we've missed out."

For their part, Apple executives at the meeting tried to allay users' concerns. They said they are addressing the networking issues and will continue to do so, both with Apple-developed products and by entering into relationships with third parties.

**Customer service concerns**  
Service and support were also on users' minds. Despite the Apple representatives' assurances that the company is formulating its internal support mechanisms and making more services available for its dealers to provide to customers, some users expressed skepticism that the new strategy will work.

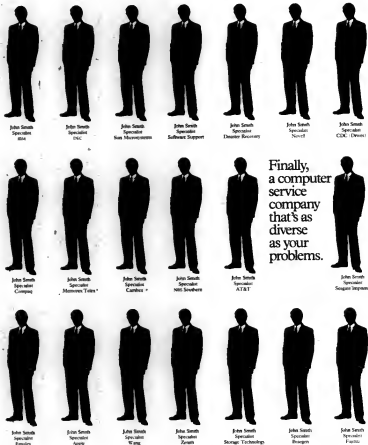
"I'm very doubtful that the dealer channel will ever come up to the level we need," said Karen L. White, supervisor of advanced technology at the California State Automobile Association in San Francisco.

Still, Morris Taradashsky, Apple's vice president of customer support, pledged that "by 1993, Apple will be the very best provider of service. We are developing an institutional support framework to make sure everyone gets the support they need."

He said Apple will make a tool called Network Design Simulator available to dealers in 1991 to help them design and analyze network performance.

Other support mechanisms include a toll-free number, a three-tier warranty reimbursement, an improved parts distribution system and more education for the Apple representatives assigned to large accounts.

What most users' problems boil down to is "that these people are taking a risk — a personal risk — by installing Macintoshes," said Keith R. Fox, vice president of Apple's Business Markets Group. "They want assurances that we will stand behind them, and we will."



Finally,  
a computer  
service  
company  
that's as  
diverse  
as your  
problems.

We're the largest independent computer service company in the world, with the largest problem-solving database. Giving us the experience and the support system necessary to service the full range of your computer needs.

We handle over 5000 products from 500 manufacturers, from mainframes to departmental networks. Providing a broad range of software and hardware support services. But more important, we handle problems. Individual problems. Your problems. We're Bell Atlantic Business Systems Services supplying Sorbus' Service. Taking care of all your needs through a single source. And a single phone number. Please call 1-800-767-2877.

Bell Atlantic

**Bell Atlantic**  
Business Systems Services

We're More Than Just Talk.

# DROWNING IN PAPER?



Managing the tremendous output of paper is one of today's most critical and costly concerns for MVS data centers. \$AVRS/TRMS, from Software Engineering of America, provides a total solution to this expensive and resource-consuming problem, with a system for the online viewing, distribution and archival of all types of system output. \$AVRS/TRMS handles all aspects of report management/distribution, and output management, including production reports, end-user reports, JCL listings and error messages, SYSLOG, and compiles. \$AVRS/TRMS is powerful, yet easy to use and is

accessible to all levels of personnel through a variety of full-screen, menu-driven interfaces including CICS, ISPF, VTAM and TSO. Full cut-and-paste, windowing and PC interfaces make \$AVRS/TRMS a flexible and broad-based solution. \$AVRS/TRMS interfaces with all popular security systems and also has multiple levels of internal security.

\$AVRS/TRMS provides a complete and cost-effective solution to all aspects of report management/distribution and output management. This is why over 2,500 data centers worldwide use \$AVRS/TRMS to control the paper deluge.

***For a no-obligation 45-day free trial or for further information, call Software Engineering of America at 1-800-272-7322.***

## **SOFTWARE ENGINEERING OF AMERICA**

WORLD HEADQUARTERS • 2001 Marcus Avenue, Lake Success, NY 11042

(516) 328-7000 Telex: 6973556 Fax: (516) 354-4015

*Products Licensed In Over 40 Countries*

## Amoco brings IS closer to end users

*Gives operating units more responsibility for application development*

BY JOHANNA AMBROSIO  
OF STAFF

CHICAGO — Amoco Corp. is reassigning about one-fourth of its corporate information systems work force to end-user di-

visions as part of a broader effort to move profit-and-loss responsibility out to business units.

The move, announced on Dec. 7 to Amoco employees, will be completed by March, said John Reid, general manager of

IS. Some 500 of a total of 1,900 staff members in the corporate IS group will now report directly to management in the operating companies, including Amoco Oil Co., Amoco Chemical Co. and Amoco Production Co.

"There will be no geographical movement, just movement on the organizational chart," Reid said. "Where they had solid-line reporting responsibility to the IS unit and dotted-line responsibility to the operating companies, it will be the other way around."

Amoco is doing this, Reid said, "to put the applications development people in closer align-

ment with end users." He said the move fits in with Amoco's corporate philosophy of giving the operating units the tools they need to take profit-and-loss responsibility for themselves.

Most of the reassigned IS employees are applications development staff members, including project leaders, programmers and analysts. Reid said they will be doing many of the same things they have done in the past, and only the reporting structure will change. In fact, recruitment, training and career management for the 500 people "will be something we in IS will continue to handle," Reid said.

Another Amoco IS executive characterized the move as "more of a reaffirmation of IS' responsibility." Richard Penion, manager at the Amoco computing center in Tulsa, Okla.,

**T**HERE WILL be no geographical movement, just movement on the organizational chart."

JOHN REID  
AMOCO

said, "I wouldn't call it earth-shattering. For me, it's business as usual; there's been no major change in our philosophy."

Reid stated emphatically that this move does not represent any intent to dismantle corporate IS. "There are very good and just reasons to keep a centralized IS unit. These include determining longer term strategy, introducing technology into the corporation in the right way and realizing economies of scale when purchasing hardware and software," he said.

The reassigned people represent about half of the corporate IS group's systems development staff. "The other half will stay here to work on those things that impact the corporation as a whole," such as human resources, Reid said.

During the past two years, Amoco has taken steps to centralize its IS function by consolidating five data centers into two, he said. "They very much remain under the control of IS."

He added that the move was not caused by the worsening economy. "The economy won't change anything here at Amoco," he said. "We've already had good practice at coping with unfavorable economic conditions."

If anything, Reid said, the economy "will cause IS to undergo the same scrutiny all other cost structures will get. We're not focused on one element of costs. We're focused on the business units, and IS expenditures are their decision — just like whether to put in a new pipeline or drill a new well."

# WHAT YOU SEE

# WHAT YOU GET



...get all of the modern features that you need to up performance while lowering your costs.

The versatile MultiModem V32 gives you transmission speeds from 300 to 9600 bps. Completely upward and downward compatible with the V32, V32bis, 212a, V32, V31 and 300 standards, the MultiModem V32 automatically recognizes and matches speeds and protocols. There's V42 and MNP error correction too, as well as remote configuration, callback security and more.

You'll also get the new CRYPT Mathis data compression and built-in MNP Class 5, allowing the MultiModem V32 to achieve throughput approaching approximately 38,400 bps. And the MultiModem V32L gives you dial-up and 4-wire leased line operation, with automatic dial back-up.

Ready-stand MultiModem V32 in desktop, rack-mount or integrated versions. You'll also get toll-free technical support that's around 24 hours.

Look at Multi-Tech, the move you'll like what you get. Multi-Tech, the move you'll like what you get. Multi-Tech, the move you'll like what you get. Multi-Tech, the move you'll like what you get.

**MultiTech**  
Systems

The right answer every time

Multi Tech Systems, Inc.  
2205 Woodbine Drive  
Minnetonka, MN 55345 U.S.A.  
(612) 795-5000 (800) 328-9717  
U.S. FAX (612) 795-9874  
International Telex 6286372 MT YTC  
International FAX (912) 321-5180

**PC**  
MAGAZINE  
EDITORS  
CHOICE  
12-11-90

# Finally, The Promised LAN

*Oracle Client/Server Systems are open, portable, integrated. And here.*

Oracle's integrated family of products lets you take everything you've read about client/server systems in the magazines and put it to use in the workgroup. Combining the economy and flexibility of PCs with the performance and integrity that used to require a mini at the very minimum.

ORACLE is portable. Giving you the widest choice of desktop servers: OS/2, six different UNIX systems and shortly, both Netware and Macintosh.

ORACLE also lets your existing minis and mainframes act as servers to desktop machines.

ORACLE works with all your existing networks. Or any networks you'd like. Novell Netware 286/386, IBM LANserver, Microsoft LAN Manager, Banyan VINES, TCP/IP, and many others.

And it goes without saying that because ORACLE is open, it supports all the front running front-ends. Including Paradox, Lotus 1-2-3, even Dbase applications.

Or you can develop your own client applications with Oracle's integrated set of development tools. Including a powerful 4GL, screen generator, report-writer and menu generator.

But more than just software products, Oracle provides all the support services to fully transfer client/server technology to you. These services, combined with ORACLE software products, guarantee your technology investment.

1-800-633-1073 Ext. 8119

Call for more information, or to register for an Oracle Client/Server Forum. You've been stuck in never never LAN long enough.

## ORACLE®

Software that runs on all your computers.

ORACLE SERVER  
FOR OS/2

ORACLE SERVER  
FOR VINES

ORACLE SERVER  
FOR PC UNIX

Excel

Paradox

ORACLE Tools

Lotus 1-2-3

Dbase

ORACLE CASE

AutoCAD

SQL\*Forms

Orma 5

HyperCard

4th Dimension

ChemDraw

# Keep your users



\*Suggested U.S. list price. Adobe and PostScript are registered trademarks of Adobe Systems, Inc. in the U.S. and other countries. ©1990 Hewlett-Packard Company. PSL0023

# well fed.

Introducing the new  
HP LaserJet IID

Introducing the new HP LaserJet IID printer. The LaserJet printer for handling the high-volume requirements of the multiuser environment.

There's a lot for everyone to like and use. Two paper trays that let users easily switch between different types and sizes of paper. With each tray holding 200 sheets. Which means less reloading. Two-sided printing that allows your users to print their thoughts and reports on both sides of a page.

And, if your people would like to say good-bye to feeding envelopes manually, they can—it's done automatically by our optional envelope feeder accessory.

Thanks to the same Resolution Enhancement technology found in the LaserJet III, dot sizes actually vary. So curves really curve. Lines are never jagged. And you get resolution never before seen in a 300 dpi printer.

Output has never looked so good.

Of course, all types of options are available for all types of users. They can customize with Adobe® PostScript® software. Add memory. Or better express themselves with our MasterType library of fonts and typefaces. Even connect a Macintosh.

What *you'll* like is the reliability and service you've come to expect from Hewlett-Packard. And that the LaserJet IID is available for only \$3,595\*. So call 1-800-752-0900, Ext. 1582 for more information on the new HP LaserJet IID.



**HEWLETT  
PACKARD**





# Digital & UNIX Computing

## SERIOUS BUSINESS

by  
**Don LeCava**  
Vice President  
UNIX-based  
Software and Systems  
Group

The decisions you face about computing with the UNIX operating system may be the most important computing decisions you'll make during the coming decade. Many computer vendors claim to be "serious about UNIX." It's the fashionable thing to say these days. But the degree to which a vendor is "serious" about UNIX—and the ways in which it demonstrates its commitment—can determine if that vendor will succeed during the 1990s.

Digital is very serious about UNIX computing. And we're proving it every day with products. We've dedicated enormous resources to build the best hardware and software for UNIX computing.

In just 23 months we've announced 15 RISC-based systems that run ULTRIX, our enhanced version of the UNIX operating system. Our RISC family has grown to include six workstations and eight server/timesharing systems. In October we introduced the DECsystem 5100 and 5500 systems. These are server/timesharing and general purpose systems that fit into the low end and mid range of our RISC server family. They offer outstanding price/performance and expandability. Coupled with our new ULTRIX services for PC software, these systems make ideal servers for PC workgroups. Recently, we've also announced a family of Intel-based systems and servers designed specifically for small businesses. These systems run the SCO operating system.

### ULTRIX: Standards-Compliant, Open UNIX Computing

Digital's approach to UNIX software is dictated by your business needs. Our corporate UNIX product is ULTRIX, based on the Berkeley 4.2 release, with 4.3 and System V enhancements. We're always developing and enhancing ULTRIX. It is one of the most standards-compliant UNIX products available today, and we're continually expanding it to incorporate new standards and new capabilities.

ULTRIX is leading the way in standards compliance through Digital's support of POSIX, X/Open, and the Open Software Foundation (OSF). Digital has been a strong supporter of OSF since the consortium was founded in 1988. We recently announced plans to ship the OSF/1 developer's kit in the first quarter of calendar 1991, making Digital the first vendor to announce a ship date for such a product.

Digital is making ULTRIX compliant with all the standards of the Open Software Foundation. Today ULTRIX conforms to OSF's Motif standard for the user interface. It will incorporate the OSF standards for the Distributed Computing Environment (DCE) and OSF's Distributed Management Environment (DME) technology. These activities show our strong support for industry standards in UNIX computing.

### The Door to Open Computing

Many of you are interested in UNIX as a way to achieve "open computing"—a vendor-neutral computing environment based on portable applications and standard hardware. This kind of computing goes beyond UNIX to include multiple operating systems, applications, and hardware platforms from a variety of vendors.

Each of the three major U.S. computer vendors offers at least three families of hardware, and at least three operating systems. But there's a key difference among these vendors: only Digital merges these different families where it counts—at the application level. Through our Network Application Support (NAS) products, we can integrate VAX/VMS systems, UNIX systems, DOS systems, OS/2 systems, and Apple Macintosh systems. Computers that run the UNIX operating system are full participants in this larger, integrated computing environment. They can share data, applications, and networked resources with systems from other vendors that run different operating systems.

continued ►





Digital and UNIX software have a long and distinguished association. As we've done for the past twenty years, we will continue to enhance, market, and support UNIX-based technology.

1986

Bell Labs develops UNIX on a Digital POP-7 computer.

1970

UNIX is ported to the PDP-11 computer and the C language, also developed at Bell Labs. AT&T begins to distribute the UNIX operating system to nonprofit organizations.

1979

UC at Berkeley ports UNIX V7 to a VAX system, provides virtual memory support, and begins to distribute as Berkeley Software Distribution (BSD 3.2).

1990s

After divestiture, AT&T begins to market its version, called UNIX System V.

1983

ULTRIX adapts UNIX operating system for VAX computers and VAXstation workstations.

1988

Digital announces VAXstation IUXPX, the first technical UNIX workstation.

1988

Network Applications Support (NAS) integrates MS-DOS, OS/2, and UNIX systems into DECnet/OSI open network.

1990

DECwindows enables access to VMS, UNIX, and MS-DOS applications from anywhere on the network.

Digital announces RISC-based products:

- DECstation 2100
- DECstation 3100
- DECsystem 3100
- DECsystem 5400

1990

April—Digital announces RISC-based products: DECstationSystem 5000 ULTRIX V4.0.

October—Digital announces:

- DECsystem S100
- DECsystem S500
- application DEC 433MP.

► Serious Business continued

That's true "open computing," and it's the most important part of what Digital offers to UNIX users. We offer a highly productive family of systems that run UNIX, and a highly standards-compliant UNIX operating system. But we also enable our UNIX products to function in the larger, "open computing" environment. UNIX computing is not "open computing" unless UNIX users can benefit from all the resources of the larger computing environment. Today Digital is the only vendor offering these capabilities. That's a serious approach to UNIX software as a part of open computing.

**State-of-the-Art, Expandable RISC Hardware**

The powerful combination of UNIX software and Reduced Instruction Set Computing (RISC) systems has created the fastest-growing market segment in the computing industry today.



Digital's approach to RISC-based hardware is built on the best aspects of our VAX strategy—our RISC systems are binary-compatible from the smallest workstations to the largest multiprocessor server.

Your ULTRIX applications will run on the DECstation 2100—the lowest-priced RISC workstation in the business—and they will run on our DECsystem server family. You'll never face the burden of expensive rewrites and conversions.

We've designed our RISC systems to be highly expandable. We've built them on a foundation of tough, innovative engineering. Digital has built TURBOchannel—perhaps the fastest bus in the RISC business. And we offer the highest level of graphics board integration available today.

Our RISC systems support standards in every aspect of their design. These systems support DSSI, SCSI, Q-bus, fiber optic networking, Ethernet, and soon VME. And as further proof of our commitment to open computing, we've opened the TURBOchannel to the industry—at no charge.

We've built our RISC systems on widely available, standards-based technology from MIPS Computer Systems, Inc. And we're continuing to develop new RISC systems based on the latest technology from MIPS.

That's dedication to openness. Today Digital offers the lowest-priced RISC workstation, the fastest desktop graphics system, and the most expandable RISC servers. We're committed to creating RISC systems that continue to extend the boundaries of price/performance.



Digital's newest RISC-based systems are designed for use in commercial environments. The new servers are very fast, but their real strengths are in I/O, disk write speeds, storage, and communications—the features commercial users need most.

That's a serious approach to high performance RISC-based hardware for UNIX users.

**Serious Support for UNIX Users**

We're just as serious about support for UNIX users. During the past year, Digital has trained more than 7,000 sales and support people in our UNIX technology.

And this is only the start. Today we're working on a new generation of RISC systems, based on the MIPS technology. You'll be hearing about it in a few months. We're developing the next major release of ULTRIX, which will be based on the OS/386 standards, and completely backward-compatible with our earlier releases of ULTRIX. Soon, we will introduce RISC-based workstations that will extend our price/performance leadership.

Is Digital serious about UNIX? Indeed we are. We're so serious about UNIX that we've developed the best price/performance family of UNIX products in the industry. We've developed the most standards-compliant version of the UNIX operating system. And we've upheld our commitment to open computing—making UNIX a full member of the one truly open computing environment on the market today.

As you make your UNIX choices—what may well be your most important computing choices of the 1990s—doesn't it make sense to go with the company that's serious about UNIX? That company is Digital.



## NEWS



### Available, Stackable VAX

VAX 4000 Model 300 systems are now available in rack-mountable configurations—to save floor space via vertical system growth and to facilitate configuration flexibility with rack-mounted third-party gear. These VAX 4000 Model 300 systems are mechanically reconfigured in 19-inch wide ANSI/EIA and MIL-STD compatible rack-mountable chassis. Like the pedestal-mounted VAX 4000 Model 300 systems, the rack-mounted versions are available in multiterminal, server, and machine systems.

### PrintServer Printers Loop Off DEC Buses

ULTRIX PrintServer software is one of the first Digital products to provide portable source code for BSD 4.3-compatible UNIX systems. It has proven to be even more portable than planned, as one Digital customer with a major telecommunications company just discovered. This customer recently ported the kit to an unsupported System V platform with BSD socket extensions in just a few hours. And, since the source kit comes with the unlimited right to copy within a site, access has been given to co-workers as well.

### Got a VAX FAX Gateway?

Interested in saving time and money through increased user productivity and lower communications costs while eliminating the need for multiple fax machines? Then Digital's FAX Network Gateway is for you. This integrated network application allows tens to thousands of users on VAX/VMS systems to send and receive fax communications directly from their desktops. The FAX Network Gateway integrates computer applications and electronic mail systems with the versatility of fax transmission and reception, and it permits any fax machine around the globe to be a remote printer or scan entry device.

### VAXc System Now Price/Performance Leader

Digital recently added a cost-effective server aimed to the VAXc 3000 series and, at the same time, improved price/performance of the VAXc 3000 Model 300 systems—making Digital the industry leader in bulk-source price/performance computing, surpassing Tandem and Stratus. The new VAXc network server configuration, which controls user access to other computers on a network, improves price/performance by 50 percent for sites that want to add fault-tolerance capabilities to computing installations. The replacing of the VAXc 3000 Model 300 emulator system translates into a 27 percent increase in price/performance.

### VT1300 Works (Almost) Like a Workstation

The VT1300 color, X Window terminal offers access to more than 6,000 VMS and 1,000 ULTRIX applications previously available only on workstations. It can also access UNIX applications. The VT1300 uses the same X graphics user interface as a workstation, and it incorporates similar display features—high-performance graphics, high resolution, and eight graphics planes with 256 displayable colors. It features a 90 nanosecond CMOS processor and graphics co-processor. Standard price of \$7,495 includes 8 MB memory, a down-loadable X server software kit, a 15-inch monitor, keyboard, mouse, and manual.

## Special Projects Team No Appointment Necessary

Call 800-DIGITAL



How can you order a DECstation 3100—without even leaving your office? How can you get an order checked for accuracy—at six o'clock in the evening?

You can do all of that and more by phoning 800-DIGITAL (800-344-4825) and asking for the DECdirect Special Projects Team (SPT).

SPT members help you select and purchase Digital workstations, personal computers, and PC/LAN servers. There is no need to contact a sales representative, no need to schedule an appointment. Team members are available from 8:30 a.m. to 6:00 p.m. E.T.

You get quick, accurate information about product capabilities and configurations, trade-in programs, warranties, and order processing. You can obtain hard-copy quotes within 24 hours of requesting them from SPT. Digital is the sole computer company to offer this kind of service.

SPT members are experts on an extensive number of products, including:

#### Digital Workstations

- VAXstation 3100
- VAXstation 3520
- VAXstation 3540
- DECstation 2100
- DECstation 3100
- DECstation 5000

#### DECstation Personal Computers

- DECstation 316
- DECstation 325
- DECstation 333

#### Digital Desktop Systems

- MicroVAX 3100
- MicroVAX 3300
- MicroVAX 3400
- DECsystem 5000
- DECsystem 5100

#### PC/LAN Servers

- PC/LAN Server 3100
- PC/LAN Server 316/333

#### More... Adding On Direct Connections

Call your local Digital direct connections for fast, easy access to product information, consulting services, and product ordering.

#### Information and Ordering

800-DIGITAL  
(800-344-4825)  
8:30 a.m. to 6:00 p.m. E.T.

#### Technical Pre-Sales Assistance

800-344-4825  
(800-344-4825) 8:30 a.m. to 6:00 p.m. E.T.

## Workstation Memory and Storage Made Easy

Whether you're a RISC/ULTRIX or VAX/VMS user, our storage and memory products work hard for you in a workstation environment.

The right disk, tape, or CD-ROM storage products, as well as memory products, reinforce and often enhance the features of your Digital workstations and servers. You can depend on our disk products to provide outstanding performance. Likewise our tape drives, which couple fast, high-capacity unattended backup

with high data reliability and integrity. Choose the right amount of memory and your applications run faster, with response times reduced. More memory means more performance. Not to mention that all our storage and memory products are competitively priced, supporting flexible growth paths designed to protect existing system investments.

To make planning and configuring easier, we've compiled this overview of disk, tape,

CD-ROM, and memory products available for Digital's workstations and servers—both VAX/VMS and RISC/ULTRIX. You'll see the product options as are varied as your particular system needs.

For more detailed information on the features and benefits of these storage and memory products, contact your Digital sales representative, or call 800-DIGITAL (800-344-4825).

System	Disks	Disk Capacity	Disk Function	Tapes and CDROM	Tape and CDROM Capacity	System Memory	Memory	Option Size	Memory Slots
DECsystem 5100	R223	104 MB	Paging/swapping	TK210	525 MB	128 MB	MS44-BA	8 MB	5*
	R224	208 MB	Primary internal storage	TL204	1.2 GB		MS44-DA	32 MB	
	R255	332 MB	Expansion	T230	95 MB				
	R256	665 MB	Expansion	TK502	95 MB				
	R257	1.0 GB	Expansion	RRD40	600 MB				
	R223	1.4 MB							
DECstation 3100 DECsystem 3100	R223	104 MB	Internal paging/swapping	TK210	525 MB	24 MB	MS01-AA	4 MB	12*
	R224	208 MB	Internal storage/paging	TL204	1.2 GB				
	R255	332 MB	Expansion	T230	95 MB				
	R256	665 MB	Expansion	TK502	95 MB				
	R257	1.0 GB	Expansion						
	R223	1.4 MB							
DECstation 3100 - Model 76	R223	52 MB	Internal paging/swapping	TK210	525 MB	32 MB	MS44-AA	4 MB	8
	R224	104 MB	Primary internal storage	TL204	1.2 GB				
	R255	332 MB	Expansion	TK502	95 MB				
	R256	665 MB	Expansion						
	R257	1.0 GB	Expansion						
	R223	1.4 MB							
VAXstation 3100 - Model 76 - Model 3040 - Model 3040	R223	52 MB	Internal paging/swapping	TK210	525 MB	32 MB	MS44-AA	4 MB	8
	R224	104 MB	Primary internal storage	TL204	1.2 GB				
	R255	332 MB	Expansion	TK502	95 MB				
	R256	665 MB	Expansion						
	R257	1.0 GB	Expansion						
	R223	1.4 MB							
MicroVAX 3100	R223	52 MB	N/A	TK210	525 MB	32 MB	MS42-AB	4 MB	1
	R224	104 MB	Internal storage	TL204	1.2 GB		MS42-BA	8 MB	
	R224	208 MB	Internal storage	TK502	95 MB		MS42-BA	12 MB	
	R255	332 MB	Expansion				MS42-CA	16 MB	
	R256	665 MB	Expansion						
	R257	1.0 GB	Expansion						
VAXstation 3020	R255	332 MB	Internal storage	TK70	296 MB	128 MB	MS60-AA	8 MB	4
	R256	665 MB	Internal storage				MS60-BA	32 MB	
VAXstation 3540	R255	332 MB	Internal storage	TK70	296 MB	96 MB	MS60-AA	8 MB	3
	R256	665 MB	Internal storage	RRD40	600 MB			16 MB	

\*Option requires two slots.

The following are trademarks of Digital Equipment Corporation: the DIGITAL logo, DEC, DECclass, DECnet, DECstation, DECsystem, DECwindows, ISI, Electronic Store, MicroVAX, PDP, PrintServer, Q-bus, TK, TURBOchannel, ULTRIX, VAX, VAXi, VAXstation, VMS, and VT.  
Apple and Macintosh are registered trademarks of Apple Computer, Inc. Intel is a trademark of Intel Corporation. MS-DOS is a registered trademark of Microsoft Corporation. OS/2 is a registered trademark of International Business Machines Corporation. OSF is a registered trademark of Open Software Foundation, Inc. UNIX is a registered trademark of UNIX System Laboratories. List prices are U.S. and subject to change.



YES, I want to receive my own copy of **COMPUTERWORLD** each week. I accept your offer of \$38.95\* per year — a savings of 62% off the single copy price.

First Name  MI  Last Name   
 Title  Company   
 Address

City  State  Zip  Basic Rate: \$48 per year  
 Address Show: ☐ Home ☐ Business ☐ New ☐ Renew  
 \*U.S. Only. Canada \$56.97. Central/South America \$130. Europe \$195. All other countries \$295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

**COMPUTERWORLD**



YES, I want to receive my own copy of **COMPUTERWORLD** each week. I accept your offer of \$38.95\* per year — a savings of 62% off the single copy price.

First Name  MI  Last Name   
 Title  Company   
 Address

City  State  Zip  Basic Rate: \$48 per year  
 Address Show: ☐ Home ☐ Business ☐ New ☐ Renew  
 \*U.S. Only. Canada \$56.97. Central/South America \$130. Europe \$195. All other countries \$295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

**COMPUTERWORLD**

1. **BUSINESS INDUSTRY** (Circle one)
- 10 Manufacturer (other than computer)
  - 11 Franchisor/Supplier/Lease
  - 12 Medical/Law/Education
  - 13 Wholesale/Retail Trade
  - 14 Business Service (except CP)
  - 15 Government - State/Federal/Local
  - 16 Communications Systems/Public Utilities
  - 17 Transportation
  - 18 Management/Consulting/Engineering/Architecture
  - 19 Manufacturer of Computers, Computer Peripherals or Peripherals
  - 20 System Integrators, Mfgs., Computer Service Bureau, Software Planning & Consulting Services
  - 21 Computer/Peripheral Dealer/Distributor
  - 22 User - Other
  - 23 Vendor - Other

(Please specify)

2. **TITLE/FUNCTION** (Circle one)
- MANAGER/ADMINISTRATOR**
- 10 Chief Information Officer/Vice President/Chief VP
  - 11 IS/IT/CP Management
  - 21 Dir. Mgt. Mkt. Services, Information Center
  - 22 Dir. Mgt. Syst. Planning, Adv. Syst., Data Comm.
  - 23 Systems Eng. Mgt., Dir. Mgt. PC Resources
  - 24 Systems Eng. Mgt., Dir. Mgt. PC Resources
  - 25 Mktg. Syst. Development, Sys. Architecture
  - 26 Mktg. Syst. Development, Sys. Architecture
  - 27 Sys. Integration/Mktg./Consulting Mgt.
  - 28 Other Computer Management
  - 11 President, Owner/Partner, General Mgt.
  - 12 Vice President, Chief VP
  - 13 Treasurer, Controller, Financial Officer
  - 14 Engineering, Scientific, R&D, Tech. Mgt.
  - 15 Sales & Mktg. Management

(Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
- Type of equipment with which you are personally involved either as a user, operator, or consultant:
- A. Microcomputer/Personal Business Computers
  - B. Mainframe/Minicomputer Business Computers
  - C. Communications Systems
  - D. Local Area Networks
  - E. No Computer Involvement

E4051F-5

1. **BUSINESS INDUSTRY** (Circle one)
- 10 Manufacturer (other than computer)
  - 11 Franchisor/Supplier/Lease
  - 12 Medical/Law/Education
  - 13 Wholesale/Retail Trade
  - 14 Business Service (except CP)
  - 15 Government - State/Federal/Local
  - 16 Communications Systems/Public Utilities
  - 17 Transportation
  - 18 Management/Consulting/Engineering/Architecture
  - 19 Manufacturer of Computers, Computer Peripherals or Peripherals
  - 20 System Integrators, Mfgs., Computer Service Bureau, Software Planning & Consulting Services
  - 21 Computer/Peripheral Dealer/Distributor
  - 22 User - Other
  - 23 Vendor - Other

(Please specify)

2. **TITLE/FUNCTION** (Circle one)
- MANAGER/ADMINISTRATOR**
- 10 Chief Information Officer/Vice President/Chief VP
  - 11 IS/IT/CP Management
  - 21 Dir. Mgt. Mkt. Services, Information Center
  - 22 Dir. Mgt. Syst. Planning, Adv. Syst., Data Comm.
  - 23 Systems Eng. Mgt., Dir. Mgt. PC Resources
  - 24 Systems Eng. Mgt., Dir. Mgt. PC Resources
  - 25 Mktg. Syst. Development, Sys. Architecture
  - 26 Mktg. Syst. Development, Sys. Architecture
  - 27 Sys. Integration/Mktg./Consulting Mgt.
  - 28 Other Computer Management
  - 11 President, Owner/Partner, General Mgt.
  - 12 Vice President, Chief VP
  - 13 Treasurer, Controller, Financial Officer
  - 14 Engineering, Scientific, R&D, Tech. Mgt.
  - 15 Sales & Mktg. Management

(Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
- Type of equipment with which you are personally involved either as a user, operator, or consultant:
- A. Microcomputer/Personal Business Computers
  - B. Mainframe/Minicomputer Business Computers
  - C. Communications Systems
  - D. Local Area Networks
  - E. No Computer Involvement

E4051F-5



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**

FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

**COMPUTERWORLD**

P.O. Box 2044  
Marion, Ohio 43306-2144



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**

FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

**COMPUTERWORLD**

P.O. Box 2044  
Marion, Ohio 43306-2144



## ADVANCED TECHNOLOGY

## The race is on for the world's first 64M-bit chip

Companies such as IBM are increasing their investment in the development of advanced DRAM chips

BY MICHAEL ALEXANDER  
OF STAFF

A mainframe small enough to wear on your wrist like a watch. A supercomputer that easily fits on your lap. A pocket-size voice recorder that records an hour of voice without using tape. A portable high-definition television smaller than this newspaper. It seems that anything is possible with 64M-bit dynamic random-access memory chips.

Even though 4M-bit DRAMs are only now being produced in volume and the first production samples of 16M-bit chips are slated to arrive in the coming months, the world's top semiconductor manufacturers are racing down the road to the next generation of 64M-bit chips.

About a dozen companies in the U.S., Europe and Japan are working on 64M-bit DRAM chips, including Hitachi Ltd.; NEC Technologies, Inc.; Mitsubishi Electric Corp.; Fujitsu Ltd.; Toshiba Corp.; Siemens AG; IBM; and Texas Instruments, Inc.

"Who will get there first is the big question," said Robert Frizell, senior analyst at VLSI Research, Inc., a chip technology and market analysis

firm in San Jose, Calif. The first samples will probably begin to appear in late 1993 or early 1994, according to Frizell.

The world market for semiconductor was approximately \$50 billion in 1989, with an average growth rate of 15%, according to market researchers. The memory chip market makes up more than 25% of the total semiconductor market.

Whoever gets to market first stands to gain the most and recoup what will have been a significant investment in research and development and production facilities. "A cost [of] \$1 billion wouldn't surprise me," Frizell said.

**Initial price drops**

The cost of a new semiconductor rapidly plunges soon after it is introduced. "One generation might come out at \$200 to \$400 a part, and within six months to a year, after volume production is up, that price might drop to \$40 to \$50," Frizell said.

IBM, which was first in the world to produce 64K-bit, 1M-bit and 4M-bit DRAMs in production quantities, is working on 64M-bit chips for its own use, however. In October, the company opened its Advanced Semiconductor Technology Center in East



Robert Frizell

Fishkill, N.Y., and said it has committed \$500 million to the center to develop the next generation of 64M-bit and 256M-bit DRAM chips.

There is general agreement that computer memory capacity should grow in proportion to its speed, if the speed is to be used effectively, according to Fujio Masuoka, a manager of the device research department at Toshiba's Research & Development

Center in Kawasaki, Japan. He heads a team that in a matter of weeks will introduce a prototype 64M-bit DRAM.

In a paper for the Institute of Electrical and Electronics Engineers, Inc., Masuoka said the general rule of thumb is that memory capacity in megabytes should be equal to four times the processor speed in millions of instructions per second (MIPS).

Using today's 1M-bit chips, 1G byte of main memory is about what can be used to still keep reliability within tolerable limits, he said.

The latest workstations are capable of performing at a rate of more than 10 MIPS, which means their ideal memory size is more than 40M bytes, according to Masuoka. That is more than it is possible to build using 1M-bit chips. However, 4M-bit chips are ramping up in volume, and workstations with 40M bytes of DRAM have already been developed. Judging by past trends, the 64M-bit chip will probably be mass-produced in 1995, according to Kiyoo Itoh, chief researcher at Hitachi's Central Research Laboratory. Hitachi unveiled the world's first 64M-bit DRAM at a symposium on very large-scale integration circuits, held in Hawaii in June.

For 64M-bit DRAMs, engineers are shooting for circuit line widths of 0.25 microns. Etching lines that fine in a silicon wafer using existing optical or photolithography technology is difficult but not impossible. Recently, engineers at Fujitsu were able to develop a prototype 64M-bit chip using a technique called "phase-shifted" photolithography. The process makes it possible to etch lines as fine as 0.35 microns.

Several companies are working on a lithography process that makes use of X-rays, whose wavelengths are shorter than light and thus more precise (see story at left).

## Keeping pace with DRAM technology

Starting with the 1K-bit chip introduced in 1970, the memory capacity of DRAM chips has quadrupled about every three years. At that rate, 256M-bit chips will debut in 1998 and 1G-bit chips will show up near the year 2000. That assumes researchers will be able to resolve what may be the most difficult challenge of all: developing the technology needed to etch circuit lines small enough to pack billions of transistors onto a piece of silicon not much larger than a thumbnail.

Today, circuit lines are etched into silicon wafers by passing a light through a mask, which acts like a photographic negative, onto a silicon wafer that has been dipped into an acid bath that etches the lines into the wafer. The process is called optical or photolithography. Circuit lines can also be etched into the surface of the wafer using a process called electron-beam lithography. The drawback is that the process is too slow to mass-produce 4M-bit or greater chips in high volume.

Engineers now believe that a process called X-ray lithography will allow them to etch even finer lines than is now possible into silicon wafers with the density needed to produce 64M-bit and greater chips.

X-rays have a shorter wavelength than ultraviolet light, whose wavelengths are too large to make the ultra-fine lines that are needed. Today's photolithography etching process operates at about 1 micron, or about one-hundredth the width of a human hair, which is enough to pack the equivalent of one million transistors on a single chip. In comparison, the X-ray process can etch circuit lines of about 0.1 micron, or about one-thousandth the width of a human hair—fine enough to

put the equivalent of four billion transistors on a chip.

The device that can create the X-rays for circuit etching is an electron storage ring called a synchrotron. Electrons are shot into the ring and whip around at close to the speed of light. Magnets bend the path of the speeding electrons, throwing off X-rays, which are funneled down beam lines to an exposure station. The X-rays pass through a mask onto the silicon wafer.

**Developing small rings**

One hitch has been the need to develop synchrotron storage rings small enough to be used on the factory floor. Most of those in use now have rings that measure hundreds of feet in diameter. However, the National Synchrotron Light Source at Brookhaven National Laboratory in Upton, N.Y., has developed a prototype synchrotron that is only 13 feet long and 7 feet wide. Some Japanese firms have also built compact synchrotrons in the range of 13 to 16 feet long.

IBM, considered among the world's leaders in X-ray lithography, plans to have the first privately owned synchrotron storage ring running late next year at its Advanced Semiconductor Technology Center in East Fishkill, N.Y. The compact, superconducting synchrotron is about 20 feet long and 7 feet wide and is being built to IBM's specifications by the Oxford Instrument Group in England. IBM has been experimenting with X-ray lithography processes at the Brookhaven Laboratory and will shift its work to the new center when its own ring is operational. Researchers have used the technology to produce experimental chips with 0.25-micron line widths, IBM said.

MICHAEL ALEXANDER

## EDITORIAL

## 'Tis the season

**T**HAT season's drawing once more near,  
So here's our yearly gift of cheer  
To those whose actions, bold and meek,  
Fill our pages every week.

Let's hang on Exley's Christmas tree  
A phone that can't call AT&T,  
Or if bidders be they still,  
A candy-coated poison pill.

To Manzi, Lotus' erstwhile coach,  
We take a more Novell approach,  
With no more mergers in his head,  
He'll sue for look and feel instead.

To Frank Dodge here are Tonka trucks  
To hold his 14 million bucks  
Of pay for suffering the frustration  
Of taking a one-year vacation.

John Cullinane can stuff his sock  
With lumps of coal called CA stock.  
Oracle's gift? A quick review  
On recognizing revenue.

Ingres shopping's an easy task;  
All they had to do was ASK,  
Though Unisys would be more merry  
If Burroughs never heard of Sperry.

IBM has special reason  
To party in this special season:  
Its mainframe performance sure is rousing,  
Almost good as RS/6000.

What gift for OS/2 is best?  
How 'bout some user interest?  
Or better yet, a stunning blow  
Like bugs in Windows 3.0.

DEC hopes to find beneath its tree  
A real live Unix strategy  
Or, perhaps, another chance  
To stage a midrange renaissance.

Software firms should get some lifts  
From brightly wrapped vaporgifts.  
Apple's present: a paradigm.  
Macs are cheaper, you just can't buy 'em.

Compaq wishes Yuletide bells  
Would ring away those ads of Dell's,  
While dealers hope the season's bargains  
Aren't harbingers of future margins.

Wang folks have a special rhyme:  
"Jingle bells, it's a Miller time!"  
While down the road at Prime, they might  
Give thanks for their own Silent Knight.

For Paperback, let's trim a tree  
In tinsel cloned from 1-2-3  
Or type a worm-filled Yuletide chorus  
On Internet for Robert Morris.

To users under outsource stress,  
A season void of EDS;  
To S&L staff in their grief,  
A billion MIPS in tax relief.

Let's we drone on past our due,  
We'll want to end by thanking you  
For sticking with us through the year,  
'Cause readers are why we're here.



## LETTERS TO THE EDITOR

## Defining success

Regarding Vivian G. Wilson's editorial, "IS: A Tough Road for Minorities" (CW, Nov. 19), the words "women," "Asians" or "Hispanics" could be substituted for "Blacks," and her advice would be equally as shallow.

I have learned over the years that there is a simple formula for success in my career. First, set goals in writing. Determine what you want to do or be. Vivian suggests management as a utopia to be sought by all. Why?

Second, determine what it takes to achieve your goals.

Third, do whatever it takes to achieve your goals. Giving 110% isn't the key. Most give, at best, a 50% effort.

I wish Vivian could meet a young man I know. He left a widow and a son in Vietnam and spent 10 years as a refugee and boot person to get to Houston. He set goals, went to school and became a programmer. We hired him this year, and he's doing great. He does his work well using a workstation and a complex keyboard. Just like you and me, right? Except, you see, this man's right arm has been paralyzed since the age of 12. Successful? We think so.

Sam W. Love  
Staffing Manager  
Computer Power Group  
Houston, Texas

## Gloom and doom

In his Viewpoint article (CW, Nov. 26), Mr. Norris sounds more like a gloomy socialist than a representative of a free-market perspective.

Consider these unsupported assertions: "... there must be a substantial increase in funding

by the federal government ... These objectives [technological cooperation in R&D, manufacturing and research] can be achieved only if the federal government provides more money ..."

Government funding means you and I turn over part of our output to the government, which means we no longer have these assets to invest. The concealed, elitist presumption of those who would advocate government funding is that the judgment of a bureaucrat is somehow better than mine.

A better prescription for technology development and economic health of the nation is to disemPOWER government funding. Billions of dollars used for socialized purposes could then be used by individuals and industry for research, development, charity and private employment. The stock market would soar, because you and I are closer to the problems of the world. The nature of knowledge itself limits the ability of the politician to solve my problems for me.

F. William Bellow  
Ridgewood, N.J.

## Military missteps

Kudos to the U.S. Air Force Office of Special Investigation's computer crime unit (CW, Oct. 22). While this instance focuses on the U.S. Army Criminal Investigation Command (USACIDC), this is another situation where an organization abysmally fails to intelligently plan uses of AIS.

I am the information management specialist with responsibility for USACIDC in Europe — the only one. That entails responsibility for the automation

planning and implementation of approximately 50 USACIDC offices scattered throughout Germany, Holland and Italy. Did these agents rely on their information management people, for example, the information management office in which I work, to initially diagnose possible data recuperative/investigative measures? Of course not. They initially relied on their own "expertise," as most users do. Users feel omnipotent when they can do this, that they can then tackle any personal computer problem. Unfortunately, such "hacking" creates a false sense of computer literacy.

Here in Europe, there are no agents of the U.S. Army Criminal Investigation Command who are computer experts. They can use application software but are novices in diagnosing computer-related problems. I've visited enough of our offices here where I've recited that which the "experts" supposedly cleared up.

It's a shame the Army had to turn to the Air Force for such help. Better training and security software would have provided a more expeditious outcome with less frazzled agents' nerves during the investigation.

David Molosh  
Information Management Specialist  
USACIDC  
Heidelberg, Germany

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Labaree, Editor in Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail: COMPUTERWORLD. Please include a phone number for verification.



# Consortia offer R&D solutions

GRANT DOVE



Our country faces a growing crisis in applied research and development — the effort needed to move an invention from scientific discovery to practical use.

In its Science and Engineering Indicators Report for 1989, the National Science Board (NSB) reported a "dramatic slowdown" in funding for applied R&D. The NSB figures showed that between 1986 and 1989, spending on applied R&D slowed to an average annual growth of only 1%.

This trend is reflected most significantly in our industrial research, where the bulk of applied research and R&D takes place. At the beginning of this year, the National Science Foundation reported that we in the U.S. are experiencing negative real growth in total industrial R&D — a decline of 1% from 1988 to 1989 and the first such decline since 1975.

Because of competitive pressures, industry is now investing a much larger portion of its R&D budget in product development at the expense of the three- to ten-year horizon of applied research and advanced development.

Dove is the chairman of the Microelectronics and Computer Technology Corp. in Austin, Texas.

We risk an accelerating decline in the health of our industry if we fail to address this trend. We cannot simply create more resources.

We must use the resources we have more efficiently by actively pursuing strategic part-

nerships, increase the efficiency of resource deployment and provide a vital conduit for transferring advanced technology into product development. Consider several reasons why consortia are a vital part of our national agenda:

• Just about every U.S. business lead-

celerates the pervasive adoption of new technology. When users and suppliers cooperate, they can achieve the aggregation of volume necessary for rapid and broad deployment of new technology. This is especially applicable to technologies that may not be key differentiators in the domestic market but are serious competitors in international markets.

• Consortia can also efficiently marshal resources to develop the infrastructure required for U.S. competitiveness in a particular technology. The

ing industry standards for the benefit of each and of their customers.

• Consortia can play an important role in U.S. government's competitiveness policy. Strategic partnerships, implemented through industry-led consortia, can be appropriate, effective and efficient in the leveraging of public investment in science and technology.

In the recently released statement of U.S. technology policy, the Office of Science and Technology focused on the importance of collaborative efforts to create generic technologies in areas where the research is so expensive that a single company cannot adequately support the work.

This is precisely where cooperative research is most appropriate and the benefits of leveraging are the most compelling.

Congress — and now the Bush administration — support the role of the Advanced Technology Program in the Commerce Department, which is designed to encourage collaboration in precompetitive R&D. Another encouraging sign is language in the 1991 Defense Department Authorization and Appropriations bills that would enable the Defense Advanced Research Projects Agency to distribute \$50 million among consortia for precompetitive research.

The fact that more policymakers are focusing on the use of consortia is an indication that what began as an experiment in now being recognized as a key tool for maintaining U.S. competitiveness.

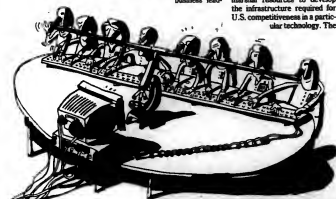


Photo Bank

nerships, leveraging our research dollars and creating incentives for advanced R&D.

This is the fundamental rationale for consortia. The Microelectronics and Computer Technology Corp. and other consortia have become centers of collaboration involving strategic partnerships between universities, industry and the government.

Consortia leverage scarce re-

search and government policymakers would agree that one of our biggest common headaches is the cost of capital. Consortia can help by leveraging R&D dollars and talent to develop new generic technologies. This is especially appropriate to longer range, higher risk emerging technologies.

• Consortia can encourage more efficient use of resources to ac-

Semiconductor Research Corp., for example, fosters outstanding undergraduate and graduate university talent as a spin-off of its semiconductor research.

• Consortia are also vital in responding to common industry challenges, especially those in support of a broad customer base. Consortia can bring suppliers and users together to achieve cost leverage in develop-

## Lotus going a little too far with Marketplace

MARY TRIM



A recent article in *The Wall Street Journal* about Lotus Development Corp.'s new Marketplace

product offers a peek into a technology future that could get personal for each of us very soon.

Scheduled for announcement next year, Lotus' Marketplace holds information on the names, addresses, shopping habits and likely income levels of 80 million U.S. households. This state-of-the-art database and accompanying software will be sold to businesses that want to reach very specific marketplaces. Unlike lists that are limited to one-time use, the buyers of this database can reuse it.

Trim is a consultant based in Menlo Park, Calif.

The product offers buyer information based on census data blended with credit bureau information and categorized by postal codes. Results are further narrowed by giving each household a "psychographic" profile developed by Equifax. They are sort of. But now your local postbox can have a "blended" and enhanced version for the price of some software and a compact disc.

Remember when the government promised you that your detailed census answers would remain protected? They are sort of. But now your local postbox can have a "blended" and enhanced version for the price of some software and a compact disc.

Marketplace fits the future trend in which vendors will create a purveyor of information rather than just the hardware and software used to create and manipulate it.

At best, this will create a new era in which vital business infor-

mation will be at our fingertips and decision-making will be greatly enhanced. At worst, it provides a platform for rampant abuse of personal information that you and I have not knowingly released for use.

The potential for abuse is being downplayed by Lotus, which seems bewildered by the storm of protest coming from privacy watchdogs. Lotus enacts the benefits of putting this information into the hands of small businesses that can't afford to lease conventional lists. This, of course, is nonsense. If a business can afford Lotus Marketplace at 8 cents per name, it can afford to buy other lists on which each name costs 12.5 cents.

### In the wrong hands

One area that privacy watchdogs are most upset about is potential misuse of the information. Lotus insists that the list will only be sold to legitimate businesses at verified addresses that have been cross-checked against a fraud file. Lotus promises stiff penalties for misuse.

Lotus' intent is laudable, but enforcement is the key. If the government can't locate and

prosecute all the fraudulent mail and boiler-room operations, how is Lotus going to assure this information doesn't fall into the hands of the unscrupulous? The software can be copied and distributed. Sure, Lotus has a long list of companies it has used for illegally copying and distributing its software. But the reality is that pirated copies of Lotus products still exist.

Lotus indicates that the use of Marketplace will not be able to pull up a profile of an individual, and that the software will only list an individual that fits a particular profile or set of parameters. This is computer doublespeak at its best. They can't get everything on you at one time, but they can keep searching to find out how many lists you show up on. Once completed, this information can be recomputed as a personal profile. That makes the information harder to obtain — but obtainable nonetheless.

Finally, Marketplace fans suggest that the net effect of this product will be that we will all receive a few more pieces of mail. I don't know about you, but my mailbox is already stuffed full of coupons, flyers and nuisance

mail that hits the garbage without even being opened. What I don't need is a few more pieces of mail to throw away every day.

In the final analysis, Lotus' Marketplace sends a signal to all of us in the computer industry that some technological frontiers will be crossed at a high price. We need to set some standards regarding the use of information. Sure, we all want highly detailed information on our potential customers to give us the competitive edge.

The catch comes when businesses' right to know becomes personal, when a company's competitive edge means that it can peek into our pocketbooks and make judgment calls on which "psychographic" category we fit into.

Who wins? Companies that take personal information that individuals have not authorized for sale and sell it to anyone with the same right to the gate.

Today, your protection is limited to writing Lotus, Equifax, or the Direct Marketing Association in New York to have your name pulled from the database. I've opted not to be victimized. My protest is already in the mail.



# SYSTEMS & SOFTWARE

## DEC sends network message

### ANALYSIS

BY MARYFRAN JOHNSON  
CW STAFF

MAYNARD, Mass. — "All dressed up and no place to go" is how one industry analyst summed up Digital Equipment Corp.'s software announcements last week.

Yet that said more about what is seen as DEC's marketing ineptitude than about the additions to its Network Application Support (NAS) program of software, services and tools for multivendor networking.

"Technically, DEC has a lead over IBM and other vendors in terms of the basic software and technology," said Judith Harwitz, an analyst at Patricia Seybold's Office Computing Group in Boston. "As far as communicating that, they do a lousy job."

What DEC unveiled was one real product — a high-level application programming interface called DEC Message Q — and plans for an object-oriented environment called Application Control Architecture (ACA).

DEC also pledged to support all of the Open Software Foundation's Distributed Computing Environment (DCE) technologies, which include standards-based technologies such as the X.500 communications protocol or Carnegie Mellon University's Andrew File System.

"DEC is the only one to belly up to [the] bar and say they'll put in full DCE, and that will be their method of communicating between heterogeneous systems," said John Dunkle, vice president of Workgroup Technologies in Hampton, N.H.

### ACA specifications

Next month, DEC will supply the architectural specifications for ACA, but no services will show up until summer 1991. Tools to develop user applications will be on the market in the fall of 1991 for DEC's VAX/VMS, Ultrix, OS/2 and MS-DOS.

In the meantime, DEC said it will seek industry blessings for its new architecture from the Object Management Group, a standards body for object-oriented technologies.

Once applications start rolling out from independent software vendors (which play critical roles in ACA's success), users could use ACA to transparently link applications such as spreadsheets, databases and word processors across the network.

Introduced in 1988, NAS has quietly expanded to include a wide range of software and services that allows information and data sharing between multivendor networked computers. The operating systems included in NAS are VMS, Ultrix, OS/2, MS-DOS, Unix and Apple Computer, Inc.'s Macintosh.

As the DEC equivalent to IBM's Systems Application Architecture (SAA), NAS should be a household word among DEC customers. Yet when Workgroup Technologies polled 200 DEC users, Dunkle said, they were uncertain about what NAS included. "DEC has not taken the high visibility position that NCR has with Cooperation or IBM has with SAA," he said.

DEC Message Q could be just the kind of product DEC needs to boost its visibility in network in-

teroperability, according to some analysts.

Unlike the other NAS services introduced so far, Message Q is slated to arrive in February with versions for several platforms at once: VMS, Ultrix, OS/2 and MS-DOS. There is also a VMS/UL6.2 option that provides data interchange and interoperability among applications residing on IBM systems.

For more than one year, the MIS department at the Allen-Bradley Industrial Computer and Communications Group in Twinsburg, Ohio, has been using DEC Message Q to integrate communications between a corporate IBM mainframe in Wisconsin and factory shop-floor Vaxclusters in Ohio.

"We're just now going to production with our first application and will be working on an automated, point-of-use inventory system," said MIS Manager Michael Krueger.

A division of Rockwell International Corp., Allen-Bradley manufactures programmable industrial controllers. The company is decentralizing its operations, moving some applications from its IBM 3090 Model 500S to the shop-floor VAXs. The Message Q interface makes communications between the IBM and DEC systems easier by "providing low-level communications capability that we would have had to build otherwise," Krueger said.

Prices for the messaging interface product vary according to platform. There are three different DEC VAX/VMS licenses, priced from \$4,000 to \$12,000, and two Ultrix licenses: a \$4,000 version for reduced instruction set computing Ultrix systems and a \$9,000 version for VAX/VMS systems. DEC Message Q is priced at \$200 for the MS-DOS version and \$250 for the OS/2 version.

## Knowledgeware announces OS/2-compatible tool set

BY ROSEMARY HAMILTON  
CW STAFF

Knowledgeware, Inc., one of IBM's key business partners in the computer-aided software engineering (CASE) market, recently announced a host-based development tool set that uses OS/2 workstations as front ends.

ADW/MVS, scheduled for initial release in the first quarter of 1991, was designed for information systems shops that do software development on mainframes with OS/2 workstations serving as front ends. It is a set of design tools that works with an encyclopedic component, which runs on IBM's DB2 and manages the development environment. The setup is similar to IBM's AD/Cycle application development strategy, which will be managed by Repository Manager and is intended to work with OS/2-based front ends.

Michael Ryan, Knowledgeware's senior vice president of research and development, said the goal is to eventually integrate ADW/MVS with IBM's Repository Manager. Initially, the company will ship a data transfer tool for IBM's Repository Manager that would allow a customer to share data between the new Knowledgeware host-based environment, ADW/MVS, and the IBM platform.

The tool, called the Repository Enablement Facility, will also work with Knowledgeware's ADW/MF host-based tool

set, which uses MS-DOS-based workstations as front ends, Ryan said.

He also said ADW/MVS is not intended as a substitute for IBM's host-based CASE platform, even though it has its own encyclopedic component that runs on IBM's DB2. He said there are some similarities between the Knowledgeware encyclopedic and IBM's Repository Manager but added that the plan is to integrate ADW/MVS with Repository Manager, which will manage various tools beyond the Knowledgeware environment.

### A select group

Knowledgeware is one of a select group of software companies that was nominated as an AD/Cycle business partner when this application development strategy was announced in 1989. The company has been working with IBM in the development of the information model — the guidelines contained in Repository Manager that will govern how applications are developed.

The company and the other business partners are also required to tailor their products to the IBM AD/Cycle platform in order to be compatible with the IBM CASE strategy. This typically involves two steps. First, they must move MS-DOS-based CASE tools to the OS/2 operating system. Secondly, they must integrate those OS/2-based tools to IBM's Repository Manager.

## IBM plans high-end AS/400 in 1991

BY MICHAEL FITZGERALD  
CW STAFF

ROCHESTER, Minn. — Saying IBM intends to plot its course for the Application System/400 based on "market-driven openness" in 1991, Robert LaBant, IBM's vice president and general manager of application business systems, recently provided an overview of its 1991 strategies for the AS/400, including a new high-end system.

Openness should in no way be confused with support for Unix, LaBant emphasized. Instead, he said, the term refers to improving the portability of application software, not of OS/400, the mid-range computer's operating system.

LaBant added that IBM intends to address customer "wants," including common communications standards,

the ability to share data among different installed systems, more widespread use of software and application portability. LaBant also said IBM would continue to enhance OS/400 to better support personal computers and

networks and give interoperability with other vendors' large systems.

"We want to bring more value-added things to the customer to enable them to achieve solutions," said LaBant, who noted that the major focus for IBM would be improving the relational database, the system manager, the network manager and the system security on the AS/400.

Dave Andrews, president of ADM, Inc., an AS/400 consulting firm based in Cheshire, Conn., said he expects IBM to introduce a multi-processor version of the AS/400 by May 1991. The whole AS/400 line will be refreshed, Andrews said, with new technology similar to the strategy IBM used when it replaced the AS/400 B models with AS/400 C.

Senior editor Maryfran Johnson contributed to this report.



Robert LaBant

IBM's LaBant included a new high-end system in his company's strategies for 1991

## Major Applications of the SAS System

Based on User Surveys

Data Analysis  
Data Presentation  
Data Access  
Data Management

Applications  
Development

37% 48% 70% 87% 90%

Executive Summary of the SAS System

Executive Summary  
Finance

Manufacturing

Marketing

Services

By David Wiley

## From the Data Center to the Desktop

SAS System Installed Sales

18000  
15000  
12000  
9000  
6000  
3000  
0  
1981 1983 1985 1987 1989

Workstation  
Minicomputer  
Mainframe

The SAS System  
is now at work  
in 58 countries.

# Why the World of Business Relies on the SAS® System.

When millions of records and billions in revenue all ride on your data, you can't settle for anything less than the world's most reliable software. That's why more than 75% of the world's most successful companies — from finance to pharmaceuticals, manufacturing to mining — depend on the SAS System. The #1 applications software system.

## A World of Choices

We've designed the SAS System for practically any application that involves accessing, managing, analyzing, and presenting data — from shop-floor quality control to top-floor executive information systems. And because SAS applications run the same regardless of hardware, you have the power to decide where those

applications belong — in the data center, at the department level, or on the desktop.

## World-Class Service

The SAS System is backed by expert technical support and consulting services, continuous enhancements, and comprehensive documentation and training. All from SAS Institute Inc., one of the world's most respected names in software.

See for yourself why thousands of companies turn to the SAS System for their most strategic applications. Call us now at (919) 677-8200 and ask for your free Executive Summary and details about our free 30-day software evaluation. In Canada, call (416) 443-9811.

**The SAS® System.  
More Choices  
for More Applications  
than Any Other Software.**



SAS Institute Inc.  
Software Sales Department  
SAS Circle □ Box 8000  
Cary, NC 27512-8000  
Phone (919) 677-8200  
Fax (919) 677-8123

The SAS System runs on mainframes, minicomputers, workstations, and personal computers.  
Copyright © 1989 by SAS Institute Inc.  
Printed in the USA.

# Seeking out children in need

BY SALLY CUSACK  
CHITNEY

**BENTON HARBOR, Mich.** — On any given day in the U.S., 1,840 children are abused, and every 53 minutes, a child dies because of poverty or related causes.

Time is essential to those working with abused children, and inadequate, improperly recorded or misplaced information can literally mean the difference between life and death.

The Berrien County Department of Social Services Office in Michigan is piloting a Unix-based computer platform to reduce this risk element by providing instantaneous on-line access to all client-related information.

Called the Childcare Protection System, the software prod-

uct is offered by Bull HN Information Systems, Inc. in Biberich, Mass., and runs on a Bull XPS 1000 minicomputer under the AT&T Unix System V operating system.

"We have access to critical, case-related information 24-hours a day," said Jane McComber, a children's protective services specialist at Berrien County. "Using the laptop computer, we can do history checks and verify facts when we're on call. Before, we didn't have access to this data after regular working hours."

## Fastest turnaround

Using the system, caseworkers can update files as necessary on a round-the-clock basis, using either home personal computers or the department's Zenith Data

Systems' laptop computer via a cellular telephone or modem. This allows them to respond accurately and quickly to calls and emergencies that are received after normal working hours.

According to McComber, if there is an emergency and a child has to be removed to foster care, the placement information can be immediately accessed. "This happens several times a week," she added, "and it used to take hours of calling around to locate appropriate and available care."

Workers access the minicomputer via one of six Bull terminals over 2,400 bit/sec. asynchronous lines, and the system incorporates two software products: the Uniplex package, which includes a word processor, spreadsheet, diary and calendar management system; and the

Oracle relational database management system from Oracle Systems Corp.

Additional features include a risk assessment function, designed to aid caseworkers in determining the risk of further harm or neglect to the child using the risk assessment model of their choice.

By reducing the administrative burden, the software also provides more time for caseworkers to interact directly with children and their families. Prior to the Bull system installation, protection service workers at Berrien County relied on endless rows of file cabi-



nets stuffed with folders to house their valuable case histories and client status reports. Each case was tracked manually, making it more difficult to identify related cases and maintain finely detailed records.

"It changes how we use our time," McComber said. "Now we have much better documentation, and we're able to cross-reference cases more thoroughly."

The Bull system, which has been in development at the Berrien County facility for three years, is now available commercially. Pricing for the system begins at \$80,000.

# Alaska Air uses systems to keep on profit course

ON SITE

BY JEAN S. BOZMAN  
CHITNEY

**SEATTLE** — Alaska Airlines, for 35 years, puts as much care into targeting its software projects as its pilots put into landing in subzero conditions on a field of sheer Alaskan ice.

The little airline, with \$916.5 million in annual revenue last year and just 1% of the U.S. airline business, has been profitable during each of the last 18 years, and it expects to report \$1 billion in revenue in 1990.

Although relatively small, Alaska Airlines and its subsidiary, Horizon Air, Inc., were able to take home a hefty \$43 million in after-tax profits last year by focusing its efforts where they are most needed.

In the area of transportation, this has meant adding new routes to fly Alaskans south to California, Seattle and Mexico instead of just flying the traditional routes that bring snowbirds north to Anchorage.

In the area of software, this has meant developing custom software that adds value to Alaska Airlines' ticketing and customer service and buying the rest of the needed software — sometimes from other airlines.

"Our software is very tactical. It's very close to the needs of the business," said Bob Reeder, director of applications development at the airline. "We do a lot of integration, but we also buy a lot of software." No matter what their purpose, all applications must interface with System One,

the IBM-based airline reservations system run by Continental Airlines. Over the years, use of this outsourced reservations service has saved Alaska Airlines millions of dollars in overhead costs, according to Alaska Airlines officials.

Even hardware purchases are carefully considered for possible impact on the bottom line. "We don't want new products to drive the IS process," said Dan Mc-

ka Airlines combined a VM system and two MVS systems that had been running on two different IBM 4300 machines and placed both on a single Amdahl Corp. 5890 miniframe.

Batch and on-line operations are now running under the Amdahl machine's Multiple Domain Facility but are segregated into separate memory partitions. As a result, Alaska Airlines pays just one IBM license fee for MVS, saving thousands of dollars in support costs each year.

The airline converted from Sperry Corp. 1100 mainframes in 1985. "Software drove the move away from Sperry, because we didn't see any future in



Alaska Airlines' Hasland, Reeder and McDonald are working to develop tactical systems

Donald, director of data processing services. "We won't jump on a technology just because it's there." The latest and greatest holds little appeal for the information systems managers here; instead, they prefer the pragmatic approach of using proven technology that enhances existing systems.

Saving money is a priority, as long as it doesn't adversely affect the business. In 1987, Ala-

ska Airlines' Hasland, assistant vice president of administration, who is Alaska Airlines' equivalent of a chief information officer.

Since then, Alaska Airlines has used an IMS database management system from IBM to track sales data. Meanwhile, McDonald and Reeder are studying IBM's DB2 relational database, but they are in no rush to install

Continued on page 28

# Swiss are betting futures

BY MICHAEL FITZGERALD  
CHITNEY

**FRANKFURT** — This nation's futures exchange threw the switch on its computerized trading system recently, making it the second such European exchange to go electronic in less than one month.

The Deutscher Terminebo (DTB) followed on the heels of the Swiss Options and Financial Exchange (Sofex), a Computerworld Smithsonian award winner that implemented an electronic exchange for Swiss stock futures on Nov. 9.

The DTB and Sofex have said they will tie their trading hours to those of the established capital markets, although the DTB will allow an hour of post-market trading. Still, the actions are being seen by some as a harbinger of a worldwide electronic trading system.

"It's just another step toward the inevitable creation of a global electronic marketplace," said Irena Peake, chairman of the Peake/Ryerson Consulting Group in Englewood, N.J. Peake added that the U.S. exchanges were behind the rest of the world in terms of automation.

The DTB and Sofex systems also claim to be the first to offer complete integration of automated clearing and automated trading functions.

Trading options and futures was illegal in Switzerland before Sofex was created in 1988, and German law before 1990 treated options losses as gambling debts, which can be walked away from. This had limited the market.

The two exchanges expect to gain liquidity from the opening of futures trading. The DTB also hopes to take at least half of the 40,000 to 45,000 daily contract

volume for Bund futures, the long-term German government bonds traded on the London International Financial Futures Exchange.

Trades are made through a blind matching system, with the computer acting as a clearinghouse for all trades, much like the system to be employed by Globex, the automated futures exchange being developed by the Chicago Mercantile Exchange, the Chicago Board of Trade and Reuters Holdings PLC.

## High costs

The Swiss have spent more than \$50 million to develop their new exchange, the Germans \$60 million. The DTB's option trading system was purchased from Sofex.

Both the DTB and Sofex rely on host computers and distributed processors from Digital Equipment Corp., although the DTB's futures trading software has been customized to allow exchange members to connect IBM's first-generation AIX machine, the 6150.

Sofex intends to purchase DEC VAX 9000s to run its system sometime next year, possibly in the first quarter, and the DTB is looking at the DEC mainframe as well. Both exchanges are engaged in heavy development of new products.

In another recent move, the Paris Bourse tipped the switch on its new Reglement et Livraison de Titres system, based on an IBM 3090 mainframe, which will be used to clear and settle stock deals.

The Paris Bourse expects to be able to challenge the London exchange for international business through the resultant cost savings and efficiencies.

## Alaska Air

CONTINUED FROM PAGE 27

it. Still, the airline did not finish at installing a more costly MVS/ESA environment late last month, after several months of testing.

Personal computers are being added wherever practical, and several key PC-based subsystems were installed during the last two years.

When possible, the PC's on-board intelligence is put to work to request data from the System One reservations system, which is otherwise accessed from dumb terminals.

Reader's developers are working on software systems to automate that process, leveraging PC power to request additional System One data as needed.

One such application is a system called Wally, which reassigns passenger seats when operations managers have to change the type of aircraft used on a given flight.

However, PCs are not considered a cure-all at Alaska Airlines. Yield management is done over a Novell, Inc. local-area network, but Alaska Airlines' frequent-flyer program is managed from the Am-dahl mainframe.

"It's tough to turn mission-critical systems over to PCs, because their operating systems aren't sophisticated enough to support them," Haskins said. "We put applications on PCs because it solved a business problem. We haven't had a religious experience that says PCs are a better platform than mainframes."

Behind all of the technology changes is a gritty philosophy that matches the highly competitive business Alaska Airlines' IS group supports.

"We aren't delivering the most esoteric solutions here," Reader said. "We're being flexible so that we can adapt to changing business conditions. But then, you don't fly into Alaska in the winter unless you're adaptable."

## Cognos presents VAX CASE tool

BURLINGTON, Mass. — Cognos, Inc. last week introduced a computer-aided software engineering (CASE) tool aimed at small to midrange VAX/VMS systems from Digital Equipment Corp.

Cognos officials said its Powercase software is the first such tool to be fully integrated within the company's Powerhouse fourth-generation language.

The tool enables users to create applications — from design to documentation — more quickly within Powerhouse. It is also integrated with ANSI, SQL and DEC RMS flat files.

According to Kristina Sorensen, an analyst at Boston-based Aberdeen Group, "Many CASE tools serve only one aspect of the application development process, such as just the design or the code generation."

Sorensen added, "Powercase's strength is that it covers all aspects of applications development."

Priced at \$15,000 for the initial license, Powercase is available immediately for VAX workstations running Decwinds.

MARYFRAN JOHNSON

### HARD BITS

## Sears named technology innovator

Digital Equipment Corp. named Sears, Roebuck and Co. the winner of the Retail Innovation Technology Award last month for its use of innovative computer technology. Sears won for its integration of a merchandise assortment planning process that relies on distributed database technology, networking and extensive end-user computing.

SAP America, Inc. has entered an agreement with professional services firm Deloitte & Touche for the purchase and support of SAP's R/2 system. The R/2 system is on-line, real-time main-

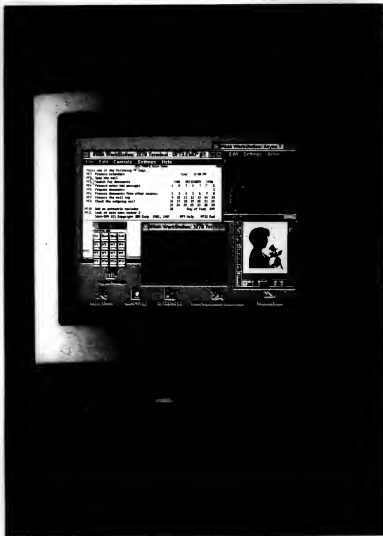
frame software for handling a range of business applications.

System Software Associates, Inc. has announced the availability of AS/SET Integrator, a new computer-aided software engineering product that integrates Knowledgeware, Inc.'s Information Engineering Workbench with System Software's AS/SET on the IBM Application System/400. The integrator product is currently available and is priced between \$3,000 and \$10,000.

Wang Laboratories, Inc. and the Uni-

versity of Southern California recently announced an alliance for marketing automated student admissions processing software. The product reportedly allows admissions counselors to view electronic images of student applications, transcripts, letters of recommendation and other paper-based documents interactively with computerized student data records.

Sun Data, Inc. and Sungard Recovery Services, Inc. are currently cooperatively marketing disaster recovery services for IBM midrange systems, including the Application System/400, System/36 and System/38. The two firms will share disaster recovery facilities and personnel as well as support capabilities.



© 1990 Digital Communications Associates, Inc. All rights reserved. DCA is a registered trademark and IBM, QuickScript, and Select are trademarks.

## For just \$149 trade up to the most feature-rich 3270 connectivity solution for Windows 3.0

Now you can get IRMAWorkStation For Windows, a \$495 value, for just \$149. Just trade up from your old 3270 communications software - regardless of who you bought it from.

Return this card with a photocopy of your original master 3270 communications software disk. Offer valid until March 29, 1991. See back of card for further instructions.

☐ Yes, send me IRMAWorkStation For Windows for \$149.00 plus \$5.00 freight. (Both  $\frac{3}{4}$ " and  $\frac{5}{8}$ " disks are included in package.)

Name \_\_\_\_\_

Firm \_\_\_\_\_ Phone \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Current 3270 Communications Software \_\_\_\_\_

IRMAWorkStation For Windows \$149.00 (Part Number 007921)

Freight 5.00

Sales Tax\* \_\_\_\_\_

Total \$ \_\_\_\_\_

Upon receipt of IRMA WorkStation For Windows you will be asked to send in your original 3.5" floppy communications software master disk via traceable carrier. If not received within 30 days, you'll be billed for the full retail cost of \$495.

Method of Payment

☐ Check enclosed    ☐ VISA    ☐ MasterCard    ☐ American Express

Name on card (please print) \_\_\_\_\_

Card # \_\_\_\_\_ Expiration Date: \_\_\_\_\_

Signature: \_\_\_\_\_

\*State local tax on product applicable in AL, AZ, CA, DC, GA, IL, KY, LA, MD, MN, NJ, NY, OH, OK, SC, VA, State/local tax on product and freight applicable in CO, CT, FL, IN, KS, MA, MI, MO, MS, NC, NE, NM, NV, PA, TE, TX, UT, WA, WI, WY. Customers that are exempt from paying state or local taxes must enclose a photocopy of their tax Exemption Certificate with order.

**HOW TO ORDER**

By Fax: Fax photocopy of master disk and order form with charge card information to (404) 442-4366.

By Mail: Send in photocopy of master disk and order form with charge card information or check to DCA Response Center, ATTN: PCS 1000-214, 1000 Alderman Drive, Alpharetta, GA 30202-9902.

By Phone or Purchase Order: Call 1-800-289-4DCA 8 a.m. to 9 p.m. EST Monday-Thursday, 8 a.m. to 6 p.m. EST Fridays.

Shipments will be by ground carrier. Please allow 4 to 6 weeks for delivery.

**DCA.**



## SAS Institute announces plan to link with Ingres database on VAX

BY SALLY CUSACK  
CW STAFF

LAS VEGAS—SAS Institute, Inc. chose Dexco West '90 as the place to announce that it is working on an application that will link the SAS Applications System under Digital Equipment Corp.'s VMS environment with Ingres Corp.'s Ingres database software.

According to SAS, the product is still in the experimental testing phase and is scheduled for release in the second quarter of 1991.

When completed, the interface will reportedly allow VMS users to seamlessly access Ingres tables directly from within the SAS Applications System or extract data for placement in SAS data files. SAS products are currently installed at 3,500 DEC VAX sites worldwide.

### SAS/CPE upgraded

In addition, SAS has released an enhanced version of the SAS/CPE performance evaluation software for DEC VAX system users.

Release 2.0 was designed to allow system analysts to collect, analyze and report on current system use as well as anticipate adjustments for future VAX performance requirements. The software offers a menu-driven screen interface and a command-line interface that mimics standard VMS utilities, the vendor said. First-year license fees for SAS/CPE range from \$575 to \$4,100.

The Cary, N.C.-based software company also revealed that the SAS Applications System will soon include vector processing support for DEC VAX 6000 and VAX 9000 users.

Beginning next month, SAS will release a collection of vector manipulation subroutines that use the VAX Vector Architecture.

## For once, an announcement that will have businesspeople jumping into windows.

Until now, a lot of businesses have been hesitant to take the plunge into Windows. People have wondered, for instance, whether critical applications and viable communications would become available.

Well, if we may be so bold, we'd like to give you a little push—by introducing you to DCA's new IRMA<sup>®</sup> WorkStation for Windows.

### A BREAKTHROUGH IN 3270 CONNECTIVITY: IRMA WORKSTATION FOR WINDOWS.

In the Windows 3.0 operating environment, only IRMA WorkStation for Windows gives you a choice of single (CUT) or multiple (DFT) sessions via coaxial cable, remote SDLC or token-ring connections, as well as asynchronous connections.

It also gives you 3270 terminal, 3270 printer and asynchronous terminal emulations, and an extensive range of 3270 and asynchronous file transfer protocols, including DCA's and IBM's. Both DCA and IBM hardware are supported, as well.

All of which means that you won't have to keep reinvesting in new software as your business's needs change.

In addition to its tremendous flexibility, IRMA WorkStation for Windows is quite sim-

ple to use, which helps boost productivity.

For instance, mainframe data can be directly embedded into a word processor or spreadsheet, using DCA's QuickScript<sup>™</sup> and Windows Dynamic Data Exchange.

Only IRMA WorkStation for Windows supports APPC and supplies you with a user interface that conforms to IBM's SAA/CUA standard. It also provides you with a transparent migration path to OS/2<sup>®</sup> using DCA/Micro-soft<sup>®</sup> Select<sup>™</sup> Communications Workstation.

### TRADE UP TO THE MOST FEATURE-RICH SOLUTION FOR \$149.

Best of all, from now until March 29, 1991, we'll let you trade up from your old 3270 communications software—regardless of who you bought it from—for just \$149 per unit (the suggested retail price is \$495). For more information or to order, call 1-800-289-4DCA, ext. 66E (please have a photocopy of your master diskette on hand to fax in to DCA as proof of purchase).

It's easy. Just take a deep breath. Close your eyes, if you feel like it.

And jump.



© Digital Communications, Inc. All other brand and product names are trademarks or registered trademarks of their respective owners.

## Dexco West draws vendors

BY GARY BYRNE  
CW STAFF

LAS VEGAS—At the Dexco West '90 conference last week, Netcom Systems announced an upgrade to its User Shell, a window-oriented interface designed for Digital Equipment Corp. VAX/VMS terminals.

Version 2.1 enables an organization to configure User Shell for each user or user group. The product uses VMS security to control access to available commands.

License fees range from \$495 for a single user to \$9,995 for unlimited users.

Some of the other products announced at the show included the following:

- Russell Information Sciences, Inc.'s Executive Office System, a menu-driven environment that protects the VMS operating system from user interference.

- A menu interface enables any application, utility or custom Digital Command Language procedure to be added to a user's menu in less than one minute.

- The product is available for VAX or Vaxstation systems running VMS. Pricing ranges from \$795 to \$34,995, depending on type of VAX configuration.

- Version 4.0 of Synthesis Computer Technologies, Inc.'s Case/sp application development system, a tool that enables users to produce C or Cobol code within a VAX/VMS environment.

- Pricing ranges from \$5,000 to \$75,000, depending on CPU size.

- Version 4.0 of Executive Software International's Diskkeeper/Plus on-line disk defragmenter. The product features a DK View utility that enables VAX managers to monitor disk fragmentation and defragmentation activities in real time.

- Pricing ranges from \$250 to \$10,600, depending on configuration.

- The company also unveiled I/O Express, an automatic data caching software package that was designed for VAX/VMS systems. A proprietary algorithm enables I/O Express to determine which blocks to keep in cache, depending on the type of application being run, the vendor said.

- Pricing ranges from \$375 to \$16,000, depending on CPU size.

- Networking Dynamics Corp.'s Multitensions 2.0, which allows VAX/VMS users to run multiple sessions from any VT-style terminal.

- License fees for stand-alone CPUs range from \$1,099 to \$8,900, depending on VAX configuration.

- Clearpoint Research Corp.'s TSB-T02 (\$54,000), an IBM 3480-compatible, rack-mountable, 18-track, 4-in. cartridge-tape subsystem designed for DEC VAX 6000 and 8000 series systems.

- Clearpoint also announced that its DCME-D52, a memory upgrade for the Decstation 5000 Model 200, is now available in 8M- and 32M-byte versions, which are priced at \$2,000 and \$10,000, respectively.

- Version 3.1 of Gray Matter Software Corp.'s Scriptserver Printing System, designed to interface with and manage local or network attachments of multivendor Adobe Systems, Inc. Postscript-based printers to VAX/VMS systems.

- License fees range from \$495 for Vaxstations to \$3,995 for Vaxclusters.

# The IEF™ can help you devel unprecedented quality, prod



"The IEF is a superior tool for implementing Information Engineering because it integrates the entire process from planning through code generation. We're deploying the IEF throughout the corporation."

**David V. Evans**  
Vice President  
Director, Information Systems  
J.C. Penney



"The strengths of the IEF are clear-cut. One obvious quality advantage is that application changes are made to diagrams, not code. This ensures ongoing integrity—the specification always matches the executing system."

**Paul R. Hassinger**  
Chief Technology Officer  
Computer Task Group



"We are using the IEF to develop a new generation of manufacturing systems replacing over 300 existing systems. We estimate that IEF will increase our productivity by between 2-to-1 and 3-to-1 for new systems development."

**Wai Budzynski**  
Head of Operations, Systems/Computing  
Rolfe-Royce



"Our On-line Banking system has been in production for more than 12 months—500,000 transactions a day—without a single code failure. And we had very few enhancements to do. Our users got what they needed the first time out."

**Mark Oulian**  
Senior Programmer/Analyst  
Huntington National Bank



"I've seen other CASE tools fail, so I raised the bar high when we evaluated the IEF. It passed with flying colors. I could not be happier with my decision to adopt the IEF company-wide."

**John F. Mott**  
President  
AMR Travel Services



"We used the IEF to rebuild our aging Frequent Flight Bonus system. With DB2 tables of up to 52 million rows, we needed high performance. And we got it...98% of our transactions complete in less than 3 seconds."

**Cioene Goldsborough**  
Director of Data Resource Management  
TWA



"To meet the dramatically reduced time-to-market requirements for our products, we need high-quality systems that can be changed fast. That's why we've chosen the IEF as the CASE solution for our entire organization."

**John Pajak**  
Executive Vice President  
Mass Mutual Life Insurance



"Our users were extremely pleased when we finished our first project—a 60-transaction system—in one-half the budgeted time. We had tried interfaced CASE tools without success. IEF integration makes the difference."

**Giorgio Sorani**  
Division Head - MIS  
Lubrizol



"Our first IEF system was completed faster, and with fewer errors, than any system I've ever seen. If I had to go back to the old ways, I'd find another job...outside the DP world. It means that much to me."

**Hogens Soransen**  
Chief Consultant  
Hykredit (Denmark)

# Open information systems with productivity and maintainability.

## The success of Texas Instruments CASE product is proven—in the field.

Major companies have used TI's CASE product, the Information Engineering Facility™ (IEF™), for everything from rebuilding aging high-maintenance-cost systems to development of new enterprise-wide strategic systems.

### Study shows zero code defects.

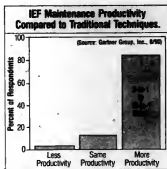
The quality of IEF-developed systems is remarkable. In recent CASE research by The Gartner Group, application developers were asked to report the number of abends they had experienced. (An "abend" is a system failure or "lock-up" caused by code defects.) IEF developers reported zero defects—not one abend had occurred in IEF-generated code.

### Maintenance productivity gains of up to 10-to-1.

In this same study, developers were asked to compare IEF maintenance productivity with their former methods. Of those responding, more than 80 percent had experienced gains of from 2-to-1 to 10-to-1. (See chart.)

### Specifications always match the executing application.

With the IEF, application changes are made to diagrams, not code. So, for the life of your system, specifications will always match the executing application. The Gartner Group research showed that all IEF users who reported making application changes made all changes at the diagram level.



Developers were asked to compare IEF maintenance to former methods. Of those responding, more than 80% reported productivity gains of from 2-to-1 to 10-to-1.

### Mainframe applications can be developed and tested on a PC.

With our new OS/2 toolset, you can develop mainframe applications, from analysis through automatic code generation, on your PC. Then, using the IEF's TP monitor simulator and the diagram-level testing feature, you can also test these mainframe applications without ever leaving the PC.

### More environmental independence coming soon—develop on PC, generate for DEC/VMS, TANDEM, UNIX.

The IEF has generated applications for IBM mainframe environments (MVS/DB2 under TSO, IMS/DC, and CICS) since early 1988. Soon you'll be able to develop systems in OS/2 and then automatically generate for other platforms. DEC/VMS, TANDEM and UNIX are scheduled for availability in 1991. More will

follow. We are committed to increased environmental independence in support of the Open Systems concept.

### We are committed to standards.

IEF tools and IEF-generated code will comply with standards as they emerge. We will adhere to CUA standards and to the principles of IBM's AD/Cycle and DEC's Cohesion—and we will support Open Systems environments centering around UNIX. In any environment, the COBOL, C and SQL we generate adhere closely to ANSI standards. Our presence on standards committees helps us keep abreast of ANSI and ISO developments affecting the CASE world.

### Full-service support.

Of course, our technical support, consultancy, training courses, satellite seminars, and other informational assistance will continue apace. We also offer re-engineering and template services. This full-service support will remain an integral part of the IEF product.

For more information, including a VHS video demo, call 800-527-3500 or 214-575-4404.

Or write Texas Instruments, 6550 Chase Oaks Blvd., Plano, Texas 75023.

**TEXAS  
INSTRUMENTS**



## NEW PRODUCTS — SOFTWARE

## Unix software

Interactive Development Environments, Inc. has announced that Software Through Pictures Release 4.2 is now available for Sun Microsystems, Inc.'s OpenWindows Version 2.0 operating environment and Sun's Sparcstation 2 workstation.

The product allows users to set up an X Window System X11-based software development kit that consists of a Sun Sparcserver 490 to Sparcstation SLC combined with an X11 display server.

Single license fees range from \$5,000 to \$21,000, depending on configuration.

## Interactive Development Environments

595 Market St.  
San Francisco, Calif. 94105  
(415) 543-0900

## Applications packages

Andersen Consulting, a division of Arthur Andersen & Co., has introduced job-shop software modules as part of its IMAC-PAC integrated manufacturing, distribution and financial application software package, which was designed for IBM Application System/400s.

The modules enable users to manage inventory, purchasing, planning, job control and cost functions within a job-shop manufacturing environment.

Pricing ranges from \$8,000 to \$30,000, depending on the hardware model.

Andersen Consulting  
69 W. Washington St.  
Chicago, Ill. 60602  
(312) 580-0069

IBM has announced an enhanced version of its Optimization Subroutine Library (OSL), a mathematics package designed to allow users of workstations, mainframes and supercomputers to solve complex applications.

The product can find a series of optimal

solutions after an initial calculation has been done without having to recalculate the entire problem, the vendor said.

OSL runs on IBM Personal System/2s, RISC System/6000s and all System/370 and 390 processors.

Pricing ranges from \$2,285 to \$149,200, depending on the type of system used.

IBM  
T. J. Watson Research Center  
P.O. Box 218  
Yorktown Heights, N.Y. 60598  
(914) 543-3471

Tesseract Corp. has announced a set of human resources applications designed for midsize firms and larger organizations with limited resources.

HRMS Express enables users to enter a new employee's record into a single database that contains information on all employees and work with the same data throughout other applications.

The product features predefined table entries and code sets, established screen definitions and implementation aids, the vendor said.

It runs on IBM mainframes under DOS/VSE and MVS and cooperatively under OS/2 or DOS Version 3.0. Pricing starts at \$75,000.

Tesseract  
150 Spear St.  
San Francisco, Calif. 94105  
(415) 543-9320

## Computerworld Recruitment Advertising Works.

Because of our long-term recruitment success,  
we place 100% of our national media advertising  
in one publication. *Computerworld.*

Stephen J. Kuby  
President  
National Computer Associates



Stephen Kuby is not only President of National Computer Associates but also President of Abacus Consultants, Inc. in Denver. Having been in the recruitment business for nearly 15 years, he knows the critical role advertising plays in finding the best qualified professionals. He also knows where his recruit most advertising dollars are best spent.

Founded in 1971, National Computer Associates (NCA) is an exclusive group of private firms dedicated to importing and exporting computer personnel on a national basis. With an active membership of 32 firms throughout the United States and Australia, NCA is virtually a network of "branch offices" working together to place the best qualified professionals in the right jobs. Today, NCA's aggressive growth and strategic marketing positioning make recruitment advertising more important than ever.

"Since Computerworld is the most respected professional newspaper for computer professionals, we believe it's our most direct means for reaching our entire target audience — programmers, systems analysts, and IT directors — operations, technical support, telecommunications, and PC professionals — even vice presidents and presidents. And with its national reach, Computerworld is the perfect place to tell these IT professionals about how NCA, with its pooled resources and industry expertise, offers them a wider variety of jobs to meet companies in just about every location.

"Because of our long-term recruitment success, we place 100% of our national media advertising in one publication: Computerworld. Time after time, Computerworld

produces top-caliber candidates — qualified professionals who are truly interested in keeping their careers abreast of the industry's rapid changes and trends.

"Looking ahead, we expect several factors to escalate our recruitment advertising needs — the growing demand by clients for greater selectivity, an increasingly specialized industry, a continuously mobile marketplace, and NCA's current plans to select an affiliate in the lucrative European marketplace. As this all happens, we intend to increase our advertising budget in Computerworld proportionately.

"Computerworld recruitment advertising has been equally successful for Abacus Consultants. Although we've experienced many such situations, one specific instance comes to mind. After local advertising proved unsuccessful for finding a particularly hard-to-find individual in the Denver area, the client gave us the go-ahead to advertise nationally. We ran one recruitment advertisement in Computerworld — and got an instant response from just the candidate we were looking for — right here in our local area. It just goes to show that Computerworld delivers far better candidates than any other source."

Computerworld. We're helping serious employers and qualified information systems, communications, and PC professionals get together in the computer community. Every week, just ask Stephen Kuby. For all the facts on how Computerworld can put you in touch with qualified personnel, call your local Computerworld Recruitment Advertising Representative today.

## NEW PRODUCTS — HARDWARE

## Data storage

Hewlett-Packard Co. has announced plans for its HP 9000 Series 800 and HP 3000 Series Model 900 computers to support the HP Series 6300 Model 20GB/A rewritable optical-disc library.

Users of HP 3000 Model 900s running the HP MPE/XXL 3.0 operating system will now be able to streamline backups using the Model 20GB/A optical library and the company's HP TurboStore/XXL II backup software.

A rack-mount option for the HP Series 6300 Model 20GB/A was also announced. The Model 20GB/A with rack-mount option is available for HP 9000 Series 3000 workstations for prices ranging from \$36,000 to \$84,000, depending on configuration.

Hewlett-Packard  
3000 Hanover St.  
Palo Alto, Calif. 94304  
(800) 752-0900

Perceptics Corp. has added the Triple Drive Pack 525 to its line of optical subsystems for Digital Equipment Corp. VAX/VMS and Unix workstations.

The TDP-525 provides slightly less than 28 gigabytes of write-once data storage. Its multiple optical-disc drives are connected to a host workstation via a small computer systems interface, and its Laserware software package makes the optical-disc drives transparent to the workstation's operating system, according to the vendor.

The product is priced at \$17,950.

Perceptics  
725 Pellissippi Pkwy.  
Knoxville, Tenn. 37933  
(615) 966-9200



## COMPUTERWORLD

The weekly newspaper of record for computer professionals.

San Jose: 175 Conchagua Blvd., Box 917, Fremont, MA 01901 (508) 875-0700  
New York: Mac Center 1, 305 West 29th St., Suite 100, New York, NY 10001 (212) 141-0000  
Philadelphia: B.C. 4000 Professional Mall Drive, Suite 100, Philadelphia, PA 19104 (215) 373-4115  
Chicago: 10400 West Higgins Road, Suite 200, Rosemont, IL 60018 (708) 827-4433  
Los Angeles: 4000 Wilshire Blvd., Suite 1400, Los Angeles, CA 90048 (213) 744-1100  
San Francisco: 10000 Skyway Circle, Suite 140, Irvine, CA 92714 (714) 250-0164

An IBM Communications Group

# PRODUCT REVIEW

## Sapiens almost hits the mark

### Sapiens International

This is the seventh in a monthly series of performance benchmarks that for the next several months will focus on the integration of computer-aided software engineering (CASE) and fourth-generation language (4GL) products. The benchmarks are monitored by an independent team headed by David Whiteland, managing director of Computing Futures Ltd. and his associate, Prof. Eberhard Rudolph, formerly of the University of Auckland, for exclusive publication in *Computerworld*.

Each product is observed in action over a three-day period during which a vendor team solves the case study project costing system, an application that is familiar to most information systems professionals. The team's mission is to demonstrate the capability of the major CASE/4GL environments to develop complete and complex business solutions under "live fire" conditions. In this issue,

we look at Sapiens, a rule-based, object-oriented development tool from Sapiens International.

Building on artificial intelligence technology, Sapiens, a relatively unknown product, is one of the few mainframe application generators participating in IBM's AD/Cycle.

Carried out in London, the team of two people provided a solution that fell short in a number of areas. Some of the shortcomings were cosmetic while others came from the team cutting corners to avoid a lower level time-consuming approach. While the final solution exceeded the requirements in several areas, the system still contained some bugs. We gave a rating of "good" for the level of completion.

The team completed the benchmark and its enhancement in 14 working hours with an overall effort of 24 hours. Such a development speed was remarkable. It was achieved partly because of a shrewd approach to use of time

and compromises in the solution. Nevertheless, the power of the tool was the predominant factor and justified a "very good" development speed rating.

The power of the rule-based approach was even more evident in the enhancement section, where the team was able to change 40% of the system in just one hour and 40 minutes. This time the team cut no corners and delivered without compromise. A grade of "excellent" was more than justified for speed of maintenance.

The documentation provided was straightforward, listing data elements with associated processing rules. The higher level CASE documentation was pre-

### The Sapiens tool kit

- Object-Modeller — CASE tool
- Sapiens — Development platform including a knowledge base
- Quix — Query language
- Perfect — PC/3270 emulation mainframe link

### Consultant's assessment

Level of completion					
Speed of development					
Speed of maintenance					
Documentation					
Integration of tools					
End-user language					
	Poor	Fair	Good	Very good	Excellent

sented in a pleasant graphic format but used an unusual notation, even unfamiliar to the chief developer. A comprehensive, on-line cross-reference facility keeps track of the use of each data element throughout the entire system. We awarded a rating of "very good" for documentation.

The Object-Modeller CASE tool directly created data structures in the single data dictionary. Being an early version of the CASE tool, it was limited to simple object relationships. The tools are currently fully integrated in a one-way direction (top-down). We rated the level of integration as "good."

The end-user language, Quix,

was very efficient and produced excellent results with very little effort in merely 10 minutes. The language was given a rating of "very good."

In summary, Sapiens is a refreshing product. It merges AI principles with current CASE and database technologies and produces a highly flexible and productive environment. Its particular strength lies in maintenance.

As with any new approach there are initial problems. For Sapiens to reach full potential, the CASE tool will have to leapfrog current CASE technology to incorporate rule-based development. If Sapiens can achieve this, it will become a product to be watched.

## Development and maintenance report card

### ANALYSIS AND DESIGN: D

The CASE support of the analysis and design was limited to defining objects and their relationships. No business rules were supported at this level, yet Sapiens relies heavily on general rules. The early version of the tool was unable to represent some objects and relationships of the complex transaction.

**STRENGTHS:** Graphics are well presented.  
**WEAKNESS:** Design is only partial.

### DATABASE SETUP: B

This stage took slightly longer than usual because a large number of the data constraints were defined as general rules. All data is referred to by a unique number, currently restricting a database to 10,000 items.

**STRENGTHS:** Edit checks are implemented at a global level.  
**WEAKNESS:** Data has to be defined at two levels.

### FILE MAINTENANCE TRANSACTIONS: B

The requirement of being able to update multiple files from multiple processes proved to be difficult

to implement in an object rule-based environment. One-to-one relationships were implemented "on the fly."

**STRENGTHS:** Most of the work is done by general rules.

**WEAKNESS:** Results can be unpredictable.

### COMPLEX TRANSACTIONS: C

The complex screen format and connections to the database were easily generated. As in

many other cases, the time arithmetic required special handling and proved cumbersome. Special control fields were needed to navigate between different screen sections.

**STRENGTHS:** The results can be incrementally refined.

**WEAKNESS:** Display fields cannot be concatenated.

### INQUIRES: A

The Quix query language generated the solutions with a few sim-

ple lines. While end users could write such code, they also had to be familiar with the data structure, including the awkward time representation.

**STRENGTHS:** It is very fast.  
**WEAKNESS:** No weaknesses are evident.

### COMPLEX REPORTS: D

The standard report generator could not produce the "two-up" presentation called for in the requirements. The team refused to drop to its lower level 4GL Cobol generator, thus compromising

"level of completion" for "speed of development." The report was generated from intermediate data and did not reflect the exact state of the files.

**STRENGTHS:** It is good for straightforward reports.  
**WEAKNESS:** Data duplication may be required.

### INTERFACE: B

The solution was initially developed on a single (due to resource constraints, not design constraints) Intel Corp. 80386-based DOS workstation connected via the Perfect 3270 emulator to an IBM 4361 mainframe running under VM/CMS.

Details of the product are available from Sapiens USA, 295 7th Ave., New York, N.Y., 10001, (212) 366-9394.

### Staging the benchmark



ORACLE

SQL/DS

Rdb/VMS

DB2

# Now Your Company's Islands of Information are Within Easy Reach.

## Announcing the SAS® System's Transparent Data Access

If you spend more time getting to your data than getting information from your data, it's time you got the SAS System—the world's #1 applications system. No other software makes it so easy to reach all the remote islands of information within your company—or to analyze and present data in so many different ways.

The SAS System's exclusive Multiple Engine Architecture lets you access data stored in a variety of structures across a wide range of hardware platforms... without having to know data base terminology or sacrificing data

base security. Easy-to-follow menus take you inside DB2, SQL/DS™, ORACLE®, Rdb/VMS™, Lotus 1-2-3®, dBASE®, SYSTEM 2000®, and other data bases. What's more, the SAS System's support of SQL™ gives programmers a standard language for data query. You can also use the SAS System to access raw data files in any format—even files with messy or missing data.

Once you've accessed your data, the SAS System's integrated data analysis, reporting, and graphics capabilities will help you turn bare facts into meaningful business information. Choose from such applications as forecasting... operations research... project management... quality improvement... and more. All backed by expert technical support, consulting services, documentation, and training—direct from SAS Institute Inc., one of the world's most respected names in software.

Call us now at (919) 677-8200 to receive your free SAS System executive summary... plus details about a free no-risk 30-day software trial. In Canada, call (416) 443-9811.

**The SAS® System.  
More Choices  
for More Applications  
than Any Other.**



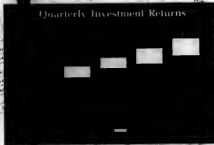
SAS Institute Inc.  
Software Sales Department  
SAS Circle ☐ Box 8000  
Cary, NC 27512-8000  
Phone (919) 677-8200  
Fax (919) 677-8123

The SAS System runs on mainframes, minicomputers, workstations, and personal computers.

SAS is a registered trademark of SAS Institute Inc. Other brand and product names are registered trademarks or trademarks of their respective holders.

Copyright © 1990 by SAS Institute Inc.  
Printed in the USA.

Quarterly Investment Returns



SYSTEM 2000

# PCs & WORKSTATIONS

## Users eye Businessland plan

BY RICHARD PASTORE  
CHICAGO

ATLANTA — Struggling Businessland, Inc. garnered votes of confidence from customers earlier this month at its two-day technology summit. The personal computer dealer also described a restructured strategy that it said will pay off by providing for more

land's problems) reflecting on our business relationship," added George Billings, manager of network computing services at Pitney Bowes, Inc. in Shelton, Conn.

Several Businessland clients, while saying they are happy with the dealer, added that they would not be overly inconvenienced should the company give up the ghost. "What we are buying from Businessland is talent," said Irene Stecher, manager of production management at Grand Metropolitan PLC. Grand Metropolitan's Filibury Corp. subsidiary contracts for on-site network support from 18 Businessland employees.

"If something was to happen to Businessland, I have very confidence that we could arrange something like a transfer for these people," Stecher said.

**No Federal Express**  
Federal Express is also not worried. "We're not so strategically aligned — whatever happens [to Businessland] won't hurt us," Esposito said.

Other users are not as blasé about Businessland's fortunes. "Our decision to go with Businessland was made before the problems with their indicators," said P.J. Gottardi, manager of information services at Phillips Petroleum Co., which has a long-term hardware contract.

Gottardi said he is happy with Businessland, but "I look at their difficulties now, and I hope they're temporary," he said.

Early 1991 is Businessland's goal for restored profitability, and management is counting on a

new operating structure to help reach this target.

At the same time, the new operating groups are intended to speed up delivery, enhance technical expertise and keep prices competitive, according to Leslie McNeill, vice president of strategic planning at Businessland and the architect of the new structure.

While all of the dealer's services were once driven by its single sales division, Businessland broke its operation into four independent segments late last month. The General Products

Division will handle commodity sales. Network Systems will offer network installation and integration services and large-scale technical applications. The Service Division will support desktop hardware. The last group, Distribution, will handle internal shipping and warehousing.

With the segmentation, "customers will see more efficient delivery of product, and the availability will improve," McNeill said. For example, Businessland now offers Quickship, a toll-free PC-order line with a 24-hour turnaround. A more focused concentration on the service segment will achieve the goals of 85% spare parts availability and an 85% rate for first-

visit fixes, McNeill said.

While he is satisfied with current service levels, Billings said the segmentation could lead to improvements. "With this differentiation, I would think we could get better service because people could specialize and not be spread too thin," he said.

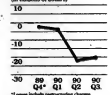
Businessland's segmented focus will also reduce overhead, which in turn should lead to more competitive prices for customers, McNeill added. However, with service now officially separated from sales for the first time, the days of free support are finally over, he said.

"No one segment will subsidize another," McNeill said. "We have to make a profit."

### Deteriorating picture

Businessland's results have been in the red all year

Profit/Loss  
(in millions of dollars)



Source: Businessland, Inc. C.W. Chart Post Week

efficient service and competitive prices.

Despite the financial beating Businessland has taken in the past 12 months, major customers attending the summit described their relationship with good satisfaction.

"I haven't seen any cutback in what they do for me," said Michael Esposito, manager of advanced technology systems at Federal Express Corp. The courier buys hardware, software and some PC support services from Businessland.

"I haven't seen [Business-

## Si, this word processor is bilingual

BY JAMES DALY  
CHICAGO

SANTA CRUZ, Calif. — A small start-up software house has created a bilingual English/Spanish word processing program that is intended to offer dramatic benefits for firms in places where a large Hispanic population resides.

Westcliff Software, Inc.'s "Dos Amigos" program, or "two friends" in Spanish, allows users to both in English, Spanish or both at the same time, thus allowing computer access to a heretofore untapped labor pool, company officials said. The program creates, edits and checks the spelling in a document in both languages and comes with a bilingual dictionary of more than 251,000 words.

Dos Amigos, which has been enthusiastically received by the

Hispanic Chambers of Commerce, was designed by a pair of former Borland International, Inc. developers who said a burgeoning market was largely overlooked.

"Hispanics are one of the fastest growing population segments in America, yet somewhere the computer industry has failed to recognize this," President Mark Andrews said. He and Executive Vice President Jim Moody estimated that there are more than 900,000 Hispanics working in the San Francisco Bay Area alone.

### Choice of defaults

The user chooses English or Spanish as the default that appears on the screen when the program is started, but second-language interpretations of all aspects of the product are available: menus, Help screens, man-

uals and software tools.

While Dos Amigos is not a translator, single-word translation duties can be performed, Andrews said. For example, if a user wanted to interpret "powerful" into Spanish, he would press a key and the words "potente" and "fuerte" would be inserted. The user would then insert the chosen word. Westcliff officials admitted that cultural and linguistic nuances make it nearly impossible to develop a 100% accurate automatic translation program, but said they are moving in that direction.

The application allows the user to do mail merges, print and share files with other personal computers.

The suggested retail price of Dos Amigos is \$149, but Westcliff officials said they are offering the program at an introductory price of \$124.50.

## CICS OS/2 Programming Is Now as Easy as:

### >A: SETUP

**MICRO FOCUS**  
A Better Way of Programming™

You can now get IBM CICS OS/2 as an optional add-on to the Micro Focus COBOL/2 Workbench™!

Here is what's included in the CICS OS/2 Option:

- IBM CICS OS/2 on Diskette Media
- SETUP Procedure
- BMS Screen Development Facility
- Integrated Preprocessor
- Online Help

- CICS programmers can now get Micro Focus COBOL/2 Workbench and the powerful inter-system communications of IBM CICS OS/2 to create and test new "cooperative processing" applications. You can process CICS transactions on local workstations and access databases on a CICS host or its networked CICS OS/2 system.

- The Micro Focus SETUP procedure installs the CICS OS/2 Option on your programming workstation within 30 minutes! This makes CICS OS/2 accessible from the Micro Focus menu system. There is no need to do an actual install on the host.

- The integrated preprocessor in the CICS OS/2 Option allows programmers to debug in the EXEC level and view original source code instead of expanded precompiled code.

- The BMS screen development facility can design and point CICS transaction screens or output BMS outputs.

- Micro Focus Advanced ANIMATOR™ lets CICS programmers create program structure charts, monitor multiple data variables, analyze source code execution, or alter the flow of control. Workbench has all the tools you'll want for debugging and testing sophisticated online transaction applications.

- IBM CICS OS/2 lets your workstation host CICS applications with its transaction data files and databases transparently. Build and test these applications with the CICS OS/2 Option and take full advantage of the transaction routing and function shipping features to reduce host and network loads.

Let your applications reside where your business needs them! Develop and test cooperative processing applications with the CICS OS/2 Option for Micro Focus COBOL/2 Workbench.


For more information about the CICS OS/2 Option call Micro Focus today at 1-800-872-6265 or 415-856-4161.

IBM and CICS OS/2 are trademarks of International Business Machines Corporation.



Imagine a world where one company...





...connects the strengths of two. Where a hundred-year heritage of product quality joins with a bold spirit of innovative technological development. And a mutual commitment to helping the customer succeed creates one of the largest data communications support organizations in the world. Imagine value-added products and services that reflect a single-minded focus on customer satisfaction. Where one company's knowledge of your business connects with your own in a strategic partnership. Imagine, at

last, a single connection to successful data networking. Now, imagine that one company...  
AT&T Paradyne.

To find out how you can connect with success in data networking, call 1 800 482-3333 Ext. 217.  
In Canada, call 1 416 494-0453.

Europe (44) 923-55550 FAX: (44) 923-55638, Japan (81) 3-245-0431  
FAX: (81) 3-245-0433, Hong Kong (85) 25-430083 FAX: (85) 25-413767,  
Latin America (1) 813-530-2865 FAX: (1) 813-530-2575



# NO CONTEST.

In the race for performance, no other application development environment can keep up with the unparalleled speed of Cognos' PowerHouse®.

Because the PowerHouse application development environment is tightly integrated with your hardware vendor's database and file management systems. So the applications you create run with maximum speed and performance. And beat anything else hands down.

And for multi-vendor and UNIX environments, Cognos StarBase® beats any other portable RDBMS. Also hands down.

No wonder PowerHouse is the most widely installed application development environment on Hewlett-Packard. On Digital. On Data General, too. And now available for the AS/400.

So try using some real tools, not toys, for application development. For more information, call 1-800-4-COGNOS. In Canada, call 1-800-267-2777.

**COGNOS®**  
**Real Tools. Not Toys.**

© 1990, Cognos. PowerHouse is a registered trademark and StarBase is a trademark of Cognos. The other trade names referenced are registered, trademarked or service marked by their respective manufacturers.

## Dutch growers use IS to fight battle of the blotch

ON SITE  
BY SALLY CUSACK  
CW STAFF

HORST, The Netherlands — Next time you eat a mushroom, consider bacterial blotch. No, it is not some weird type of skin disorder you develop from consuming mushrooms. Bacterial blotch appears as dark spots on the cap of a mushroom, and a bad case of it can be devastating to a mushroom grower.

The mushroom industry provides Holland with \$175 million per year, and the country has enlisted the aid of expert system software to help win the ongoing battle of the blotch.

Leo Van Griensven started building an expert system in 1987 at the Mushroom Experimental Station, a government institution that is financed by both the growers and the government. Together with Joost Backus, a knowledge engineer

and systems builder, Van Griensven has developed an easy-to-use system to guide mushroom growers through the threat of pests and disease during the cultivation process.

The duo relied on the Knowledge Engineering System from Software A & E in Arlington, Va., as the basis of its agricultur-

al aid program. The Knowledge Engineering System communicates to the end user by means of text, hypertext and Sony Corp. LaserVision images. The Dutch are currently running the program on an OS/2-based Compaq Computer Corp. 386/25 machine.

Because there is no cure for bacterial blotch, which occurs when there have been errors in cultivation and climate control, the expert system tries to identify problems in the cultivation process or faults in the climate control equipment.



An expert system identifies errors in cultivation techniques and climate control that cause bacterial blotches on mushrooms.

## Observers say fast CD-ROM 'not a big deal'

BY CAROL HILDEBRAND  
CW STAFF

Hitchhike Sales Corporation of America may make it into the record books with its new compact disc-read-only memory (CD-ROM) drive, which it said is the world's fastest, but industry observers are not exactly overwhelmed by the feat.

"It's nice; they had to work hard to do it, but so what?" said John Hartigan, principal consultant at Optiview Consultants.

The CD-R1700S sports an access time — the amount of

time it takes to get from one segment of data to another on a CD-ROM — of less than 340 msec. According to Linda Helgeson, editor of "CD-ROM End User," that is about 10 msec faster than the previous record. "In terms of speed, it isn't a big difference," she said.

Hartigan agreed. "Anytime you speed [drive] up, you want to brag about it, but I just don't think that it's that big a deal."

CD-ROM drives, which have average access times of approximately 400 msec, suffer from a reputation for being slow, but

just how slow is a relative matter, Hartigan said.

"Three-handed and forty msec is not a long time. It's less than half a second. If you've got an encyclopedia application and you're looking up references in it, 340 msec isn't going to bother you," Hartigan said.

The CD-R1700S also features several safeguards that help eliminate reliability problems caused by dust and other contaminants. The unit is compatible with IBM Personal Computers, Personal System/2s and compatibles and retails for \$995.

Once the question-and-answer criteria is satisfied, the system gives the grower advice on bacterial blotch prevention.

Through an integrated technique, the user interface has been enhanced to allow the user to respond by clicking on "active words" in the dialogue window. The information is displayed on a television monitor next to the computer screen, and data is stored on a LaserVision disk.

One of the main requirements when developing the system was that it be easy to use, Van Griensven said. In this case, end users will be growers and farmers, and for many of them, this will be their first experience with

a personal computer, he added. "We have 850 small growers out there, and because they are small, they need the extension service an expert system can provide," Van Griensven said. Using the software, the grower can enter the system during cultivation for advice on pests and diseases as well as general agricultural information.

There are no actual users yet; the developers said they anticipate "going live" by year's end. Because the project runs on no profit margin, hard numbers are unavailable as to the cost of the system to the end user. However, Van Griensven noted that it is "not very expensive."

## Maximo a hit with users

BY CAROL HILDEBRAND  
CW STAFF

Millwrights and electricians are not generally the types that get excited about the latest technological bells and whistles. But Maximo Series 3 maintenance management software from Cambridge, Mass.-based Project Software and Development, Inc., may have them waving their wrenches.

"People just won't believe you when you say you've got maintenance people excited about a computer package, but they were," said Glenn Coogan, West Coast area engineer at beta-test user Ocean Spray Cranberries, Inc. in Marion, Wash. Ocean Spray uses Maximo, which tracks equipment maintenance, repair and other tasks. The six facilities nationwide manage five to 10 networked workstations each.

Maximo uses Microsoft Corp.'s Windows 3.0 as a front end and Gupta Technologies, Inc.'s Sphose relational database. User reaction to both was positive. Series 3 is the follow-on

to Maximo Maintenance System, which is in place at more than 400 firms worldwide.

"When I first saw the new Maximo screen it looked a little hokey, but the more I played with it, the more excited I got," Coogan said. He added that the only downside to Series 3 was the memory requirements. "But that's a Windows problem, not a Maximo problem."

John Curry, the technical maintenance manager at Hewlett-Packard Co. in Corvallis, Ore., said he expected the relational abilities to save him a lot of time. Currently, to change out labor and materials for a work order, Curry uploads all information, such as charge numbers and verifications of signature authorization, to an HP 3000, which then analyzes the data and sends error reports if an item is not keyed in correctly. With Sphose, "We should be able to tell whether our information is good when we type it in the first place," Curry said.

Pricing starts at \$14,480, and Maximo Maintenance System users can upgrade at no charge.

Prefer a TSO-style editor? Try a Free DOS or OS/2 demo!

# SPF/PC and SPF/2

Here are two great editors to meet your needs whether you're working in DOS or OS/2. And here's a great deal for you too — free, real-working-code demo disks that faithfully recreate the ISPF/PC editing environment.

In DOS, SPF/PC has been providing MVS and COBOL programmers with that same familiar environment for more than six years.

SPF/PC was the first PC editor to bring large file editing to the PC. With its virtual addressing feature, SPF/PC allows you to edit files as large as the real work space on your hard drive, extended or expanded memory. SPF/PC also provides you with:

- ☐ directory lists
- ☐ Command stacking
- ☐ binary editing
- ☐ 45-line EGA support
- ☐ 50-line VGA support

In OS/2, SPF/2 provides an even more seamless migration from mainframe to PC, keystroke for keystroke, with true mainframe compatibility, superior PC-processing speed, macros and 3270 emulation.

SPF/2 makes it possible to pull your applications together with its interface to IBM's SAA "blue language," REXX. And, if you already have REXX edit macros on your mainframe, you can download these to the PC to run with SPF/2.

For SPF/2, there's a new, cost-effective, Multi-User License for purchase from CTC for \$100. For information, call the contract administrator at (800) 336-3320.


Try SPF/PC and SPF/2 for yourself. A free demo is yours for the asking! Just call the toll-free, 24-hour Demo Request Hot Line at (800) 648-6700 and mention you saw this offer in the Dec 3 Computerworld.

CTC

Command Technology Corporation

1040 Marina Village Parkway, Alameda, CA 94501  
Telephones: (415) 521-5900 (800) 336-3320  
Telex: (415) 521-0369 Telex 506330 CTC

In a hurry? Call the Demo Request Hot Line at (800) 648-6700.



# The 486™ PC. It may be a little

**486™** Never before has this much power been plugged into a business PC.

Presenting the Intel 486 microprocessor—a veritable powerhouse that's been harnessed for business.

A 486 microprocessor-based PC has everything it takes to run today's high-powered applications. And run them the way you need to—simultaneously and at lightning speed.

Plus, it's compatible with the hard-



# more power than you're used to.

ware and business applications you already own, so you won't spend any extra time or money on training.

The 486 PC. Plug it in and start shocking the corporate world.

For additional information, call

1-800-548-4725 and ask for "The 486 Micro-processor Means Business" brochure.

**intel**

The Computer Inside.™

486 is a trademark of Intel Corporation.

# 4th Dimension: Speed and ease of use even better

**Technology Analysis** — a roundup of expert opinions about new products. Summaries written by Computerworld free-lancer Suzanne Wines.

**A**cius, Inc.'s 4th Dimension relational database management system package, a powerful development tool for the Apple Computer, Inc. Macintosh, is now even better, according to personal computer reviewers. Version 2 offers improved performance and ease of use, the reviewers say.

**Ease of use:** Like Version 1, Version 2 features a high-quality interface and design environment. Unlike Version 1, however, many common database operations are now built-in. **Overall performance:** Although 4th Dimension has increased speed, the package still generates large files and reads and writes to disk often during operations, so a large, fast hard disk and a lot of memory are recommended.

**Data management:** 4th Dimension ensures that all the steps in a group of data operations are completed before it executes.

**Reporting:** The product's interactive symbolic debugger and built-in commands allow nonprogramming users to turn out elegant applications. **Macintosh compatibility:** Ready-to-use buttons and other features can be implemented by standard Macintosh interface options.

At \$795, the package is not cheap, and it requires at least a Macintosh Plus with a hard drive. But for the money, 4th Dimension Version 2 brings the power of a high-end database to the Macintosh and makes database capabilities more accessible than ever.

## Reviews Summary

Criteria	PC Week 3/25/89	Mac User 3/78	Mac World 3/89
Ease of use	8	Easier than ever to use	Simpler to use than previous versions
Overall performance	8	Powerful, but	Overall performance
Data management	8	Improved file handling	NC
Reporting	9	New interface makes better reports	Powerful and flexible, sophisticated graphics
Macintosh compatibility	9	NC	Develop from Macintosh guidelines
Reviewer's score	8.4*	The best price built	Develop from Macintosh guidelines

\*Ratings are based on a weighted scale of 1 to 10 where 10 is excellent. Only PC Week rating is included in the score chart (right). NC, No comment. These are excerpts from the reviews. Refer to actual articles for details.

## RATINGS

• **Users:** John Hechendorff, University of California (performance: 8, cost: 9); David Chennault, Randy Farmer, McDonnell Douglas (8.7)

• **Analysts:** Michael Masterson, Masterson Consulting (5.4); Richard E. Meyeroff, Meyeroff Computer Consultants (7.7) "Version 2 is more accessible to end users, albeit power and users," Meyeroff said.

• **Financial:** 4th Dimension has a 65% share of the Macintosh database system market with an installed base of more than 150,000 users, according to the company. It is distributed by Acius, Inc., a subsidiary of ACI France.

## 4th Dimension

(Maximum score: 85)

Points (maximum)	Category
25 (30)	Published reviews
12 (20)	Analysts' ratings
12 (15)	Users' ratings
14 (20)	Cost evaluation

(See financial information below)

## Acius responds

**Comments from Mark Vernon, vice president of sales and marketing:**

**Overall performance:** In Version 2.1.1, we tweaked performance for the low end.

**Data management:** In Version 1, you could delete fields and files, but people were deleting data. Now they can't do that.

**Mac compatibility:** We want to be consistent with the Macintosh user interface guidelines, but we won't limit functionality.

# Double Helix: More controls improve features

## Double Helix

(Maximum score: 85)

Points (maximum)	Category
24 (30)	Published reviews
14 (20)	Analysts' ratings
14 (15)	Users' ratings
14 (20)	Cost evaluation

(See financial information below)

## Odesta responds

**Comments from Julie Lyons, product manager:**

**Ease of use:** We offer programmers three features: developing for a client/server multiuser environment, a fast, flexible method and VAX portability. **Performance:** This is one of the fastest multiuser (database management systems) running on a Mac.

**Reporting:** A pop-up list of choices will be included in the next upgrade.

## Reviews Summary

Criteria	PC Week 3/25/89	Mac User 3/78	Mac World 3/89
Ease of use	8	New viewing modes make use even easier	Easy to modify
Overall performance	7	Significantly improved	Powerful, but slow
Data management	8	NC	Good, icon-based
Reporting	8	Improved interface	Good, easy-to-use
Macintosh compatibility	9	NC	NC
Reviewer's score	8.0*	Agreed choice	Best for the money

\*Ratings are based on a weighted scale of 1 to 10 where 10 is excellent. Only PC Week rating is included in the score chart (left). NC, No comment. These are excerpts from the reviews. Refer to actual articles for details.

## RATINGS

• **Users:** Ron Anderson, manager of video production at Federal Express Corp. (performance: 9, cost: 8); Bob Antley, Antley Business Systems, Inc. (10.8). "The number one key is its ease of use. It's a very complicated, sophisticated database that's easy to use," Anderson said.

• **Analysts:** Michael Masterson, Masterson Consulting (6.5); Richard E. Meyeroff, Meyeroff Computer Consultants (8.8).

• **Financial:** With more than 50,000 installations, Double Helix is produced by Odesta Corp., which has only 150 employees. Double Helix has a 40% share of the Macintosh relational database management system market.

**O**desta Corp.'s Double Helix takes the unique approach of using object-oriented icons for data management and applications development. The current upgrade from Double Helix II to Version 3 has increased the program's speed and power, according to personal computer reviewers.

**Ease of use:** Version 3's icon-based approach makes it easy to modify databases, and there are built-in controls to ensure that icons cannot be connected to create incorrect syntax.

**Overall performance:** Helix's free-form style of database management imposes structural overhead that slows the system down when building an index, *Macworld* said.

**Data management:** Special icons or dialog boxes perform key functions that usually require procedural programming.

**Reporting:** New to Version 3 is a concession to procedural control — an icon that can hold a sequence of Helix views, eliminating the need to step manually through a series of procedures.

**Macintosh compatibility:** The icon building-block approach is combined with a visual interface and comprehensive documentation that makes the program particularly appealing to novice users who are accustomed to the Macintosh environment.

Double Helix 3.0 costs \$595 and requires a Macintosh Plus with 1M byte of random-access memory and a hard disk. It can be very useful for midsize databases that need to be modified frequently, and it offers one feature that no other Macintosh database system has: It can be used to develop applications for a VAX.

**Methodology:** Published reviews: average of available scores from published reviews multiplied by 3. Analysts' ratings: average of 1-to-10 rating (1 is poor, 10 is excellent) from product analysts multiplied by 2. Users' ratings: average of 1-to-10 rating multiplied by 1.5. Cost evaluation: average of both

groups' ratings of the cost to get a product up and running multiplied by 2. Financials: No financial ratings are included because the vendors do not release financial data. This is reflected in a reduction of the overall score from 100 to 85.

You won't get fired for buying NEC.  
You may, however, get noticed.



Introducing the PowerMate® SX/20. It gives you the power and speed of



the 20MHz Intel 386™SX microprocessor. It gives you 2MB of

RAM (which can be readily expanded to 16MB). And it

gives you the storage bays and expansion slots you need to

make your system grow as your requirements do. Most important, it gives you

something you can't get from anyone else, at any price: NEC. For more infor-

PowerMate is a registered trademark of NEC Corporation. ©1989 NEC Technologies, Inc.

mation, call 1-800-NEC-INFO. The PowerMate SX/20 from NEC. Choosing it

NEC is a trademark of NEC Corporation.


will gain you a certain amount of attention. All of it good.

NEC is a registered trademark of NEC Corporation.

**C&C**  
Computers and Communications


\*Some restrictions may apply. Call 1-800-NEC-INFO to learn the applicable NEC dealer nearest you.

**NEC**



*Doubt has an office. Anxiety has a key to the Ambition and a lunch date with Paranoia. And me, our PBX works as consistently as the tides. And just as who just happens to be passing by my office at this That ring is a chorus of thousands of AT&T workers was a peerless decision...." And as the phone rings residual value in the industry. It's ready to grow like maintenance program unequaled...." But Blame looking for some other doorway to darken. Just as asking me if I had lunch plans.*





*wasbroom. Insecurity has a stack of messages from  
I'm staring at my telephone celebrating the fact that  
I'm doing this my phone rings, and I say to Blame,  
time, I say, "Blame, you know what that ring is?  
reminding me that buying their **DEFINITY**® System  
again I say, "Blame, this system has the highest  
flowers in springtime and is supported by a  
didn't hear this last part, as he was down the hall  
well though, it was Advancement on the phone*



**AT&T**

The right choice.

# Focus on multimedia standard

BY MAURA J. HARRINGTON  
CHIEF

A compact disc version of an encyclopedia defines the location of Tibet with a video presentation of the country. A teach-yourself foreign language program aids users with pronunciation by asking them to speak into the personal computer. These are just two small examples of the potential of multimedia technology.

A growing number of companies are announcing hardware products to run these new multimedia software products — niche market applications focusing on the fields of education, corporate training, marketing and publishing.

Products introduced at the recent Microsoft Multimedia Developers Conference (CW, Dec. 3) and scheduled to ship in volume by mid-1991 include audio-based multimedia software chips and fully equipped multimedia PCs with compact disc/

read-only memory (CD-ROM) drives.

While there are already some companies with multimedia-based products that offer similar multimedia capabilities, Microsoft Corp.'s recent introduction of its Multimedia Developers Kit, which lays down standard specifications for multimedia hardware and software products, is the push that has been needed to get some of the larger computer companies to stand behind emerging multimedia technology, according to industry analysts.

**Price break coming**  
Nick Arnett, editor of "The Multimed Report," based in Santa Clara, Calif., said the fact that audio-based multimedia software companies are taking such an interest in multimedia technology

will help to bring about a break in the price barrier that can sometimes prevent a new technology or product from gaining widespread support in the marketplace.

Companies such as AT&T's Computer Systems Division, Headland Technology, Inc. (formerly Video Seven), Tandem Corp., Fujitsu Ltd. and NEC Technologies, Inc. announced that they have supported Microsoft's standard and that they will develop multimedia products in compliance with the "early 1991" under the software giant's new Multimedia specifications.

Boston, Mass.-based NEC said that next spring, it will introduce a full multimedia PC product line from the Intel Corp. 80386SX-level microprocessor on up, which is to include "at



least 4M bytes of random-access memory," a CD-ROM drive and audio, graphics, text, motion and still video capabilities, according to Marc Miller, director of strategic planning at NEC's multimedia division.

## Affordable systems

Tandy is scheduled to ship software development systems for affordable PC-based multimedia systems based on the company's 4025 LX computer, which includes a 25-MHz Intel 80386 microprocessor, according to the company.

The system — and others conforming to its specifications — will also include at least 2M bytes of RAM, a CD-ROM drive, a 30M-byte hard drive, a 1,44M-byte 3.5-in. floppy drive and video and sound capabilities for multimedia developers. Tandy's system is scheduled for delivery to customers "sometime in 1991," the vendor said.

AT&T supported Microsoft's announcement and committed to integrating multimedia capabilities into its Rhapsody Business computer product line.

Tokyo-based Fujitsu said it will also market multimedia products based on Microsoft's multimedia version of Windows, announced on the same day that the Multimedia Developers Kit was released at the developers conference.

## Combo package

Headland Technology said it is developing a multimedia computer board and CD-ROM drive combination package. It is scheduled to be available to users next spring for less than \$1,400, according to Jim Anderson, Headland's director of strategic marketing for the company's graphics products.

However, while acknowledging that the hardware products supporting the multimedia technology down to an affordable level, analysts were careful to note that Microsoft's announcement is still one of the first steps for the new technology.

Software applications for the general consumer market, analysts say, are still at least three years away.

# A personal computer sets out to sea

BY GARY H. ANTHRE  
CHIEF

**BILOXI, MISS.** — It was far and away the biggest catch of tuna that Tam Trinh had ever landed. The Vietnamese fisherman just completed his first day with an experimental, personal computer-based system, and his boat, Princess Sabrina, returned to port riding low in the water with the results.

The system was supplied by the Mississippi Department of Economic and Community Development and was built in part from software developed by the National Aeronautics and Space Administration for computing water-temperature contours from satellite data. The National Marine Fisheries Service added features to display water depth and submerged obstacles, and

the state agency added rules specifying the behavioral characteristics of 12 species of fish that live in the Gulf of Mexico. The system pinpoints on a map display those areas where fish are most likely to be found, and its water-temperature database can be updated as often as every 52 minutes.

Trinh was one of four fishermen chosen to test the system. The night after the installation of the PC, cellular telephone and antenna, he slept with the system on the boat, said David P. DeBlanc, programs coordinator for the Mississippi Technology Transfer office at the Stennis Space Center. But then Trinh started carrying the gear home with him each evening, and the word got out that the government had put some super-sophisticated equipment on his boat.

He was worried someone would slit his throat," DeBlanc said.

DeBlanc said Trinh was trained to use the system the first day out on the job, a process that took about 20 minutes over the radio.

One day, the Technology Transfer Office received a call from Trinh. The computer would not boot. When technicians discovered screws missing from the computer's case and loose parts inside, Trinh admitted he had been exploring the machine's innards. "He told us he was 'looking for the magic,'" DeBlanc said.

## Works too well?

DeBlanc said the system works so well that it has been criticized by environmental groups, who fear it may lead to depletion of the less common fish species.

The software will be licensed to Gulf Weather Corp., a Mississippi start-up based in Ocean Springs.

The company will license the software and sell monthly data feed or radio access to the satellite data, which is available for all of the world's oceans, President Frank Schatzle said.

DeBlanc said Gulf Weather will expand the service along the Texas and Florida coasts, then up the East and West Coasts of the U.S. Eventually, the compa-

ny will seek to license the system to overseas companies for use around the world.

Schatzle said data about additional species of fish will be added, and the software will be upgraded periodically based on fish-catch history from the National Marine Fisheries Service.

The system is written in Fortran for PCs based on an Intel Corp. 80286 chip as well as with IBM Video Graphics Array graphics and a hard disk.

# Apple offers protocols for terminal services

BY JAMES DALY  
CHIEF

**CUPERTINO, Calif.** — Apple Computer, Inc. moved to encourage a range of multivendor connectivity options last week by announcing that it will license its Apple Terminal Services (ATS) protocols to third-party developers and corporate IS departments.

ATS protocols are designed to allow a developer to create mainframe or minicomputer programs that display and retrieve information on remote personal computers and allow the host to play the role of a local desktop application.

The protocols are currently available on Apple's Macworkstation, a server application that provides a Macintosh interface as well as printing and filing services to client applications running on remote computers.

With the license, developers can create PC software for IBM

PCs and compatibles. The software retrieves the ATS commands from a mainframe and displays the information on the PC's screen.

The license will also allow software to be developed to display mainframe information on Unix-based workstations.

## Only on Macs before

Prior to the announcement, the ATS protocols could be used only on Macintosh computers.

Using ATS protocols, a developer could create, for example, a hotel reservation system in which a central mainframe could be accessed by hotel clerks using a variety of PC models in various remote sites.

Apple officials also announced two early third-party licensees: United Data Corp., in San Francisco, which sells software for IBM PCs and compatibles, and Integrated Solutions, Inc., in King of Prussia, Pa., a vendor of Unix software.

# Sun gets backing for commercial software

Six firms develop packages to enhance Sun's accounting software

BY J.A. SAVAGE  
CHIEF

Driving to get Unix accepted in commercial markets, Sun Microsystems, Inc. recently announced that six developers have produced versions of corporate accounting and business management software packages for Sun platforms.

The new products are large software systems that contain modules for functions such as accounts payable and receivable, and general ledger.

"We're not going specifically

into the accounting business, but accounting is a fundamental piece to get into the general business market," said Bob DeLaney, manager of market development for Sun's business markets at Sun.

## Variety of products

Products are currently available for Sun's Sparcstation platforms from State of the Art, Inc., in Irvine, Calif., in its M-90 and 90 Edition/2; from Armor Systems, Inc., in Maitland, Fla., in its Premier package; from Fourgen Software, Inc. in Edmonds,

Wash., with its Fourgen Accounting System and from Oracle Systems Corp. with its Oracle Financials.

Expected the first half of 1991 are two more packages: a Database Accounting Library from SBT Corp. in Sausalito, Calif., and Classic package from MCRA, Inc. in Glendale, Calif.

Combined, the software vendors have an installed base of more than 200,000, and Sun hopes that if those users migrate to the Unix operating system, Sun will get their hardware business, according to the company.

## OSI groups tackle user issues

Organizations are encouraged to raise the awareness of OSI

BY ELISABETH HORWITT  
CW STAFF

Now that the various flavors of the Open Systems Interconnect (OSI) standard have achieved a certain level of technical viability, consistency and stability, standards bodies are converging on the two remaining obstacles to widespread deployment of such protocols: lack of compliance testing and user resistance.

At a recent meeting of the

integrated manufacturing/networking at General Motors Corp. and a member of the MAP/Top Users Group. "At GM, a lot of my people who in the past had mostly been doing development are now focused more on implementing."

Indeed, most Manufacturing Automation Protocol (MAP) supporters in the user community today have shifted focus from getting the standard technically workable to "making things hap-

pening" to MAP 3.0 and Technical Office Protocol 3.0 while preserving compatibility with existing MAP and TOP products, Kaminski said.

Addressing user barriers to implementation of standards — "not just for open communications, but also open user interfaces, databases and operating systems" — is one of the main reasons d'etre for the Users Alliance for Open Systems, according to Kaminski, a member. Such barriers "exist within any type of organization because a lot of times you don't have a good business case" for standards deployment, Kaminski added.

Open systems are "thought of more as an appendage that maybe helps, maybe doesn't help" the organization's bottom line and key competitive strategies, Kaminski said. Another common barrier is information systems departments' frequent inability to sell top management on the idea, "because many of the high price of computers doesn't talk the same language" as business executives, he said.

The Users Alliance last week announced that it has finalized a

relationship with the Corporation for Open Systems (COS) as a more effective and formalized way of communicating its priorities to the various user and vendor standards organizations, Kaminski said. The MAP/Top Users Group is already a part of the COS umbrella; in addition, the Users Alliance hopes to use COS as a pipeline to such standards organizations as X/Open Ltd., the OSI Network Management Forum and the Open Systems Foundation, he added.

"We have the makings of an umbrella group, which could be the U.S. equivalent of what goes on in Japan and in Europe," in terms of establishing requirements definition and product direction that are focused around the requirements of users "as opposed to developing and implementing standards" in a more or less haphazard fashion, Kaminski said.

Another user group that is making more use of the COS resources is the National Institute for Standards and Technology (NIST), which coordinates stan-

dards definition and implementation for the U.S. government.

The COS announced recently that NIST has provisionally registered its test center to conduct testing to determine whether products comply with several Government Open Systems Interconnect Profile specifications, including X.400, X.25, transport, File Transfer, Access and Management (FTAM) and 802.3.

The COS also recently announced that it has issued a request for information, looking for tools that can be used to expand its COS Mark conformance testing program to include additional OSI protocols, according to COS spokesman Eric Bolton.

The protocols to be added include: X.400 (1988 version), CCITT X.500 directory services, additional FTAM functionality and OSI network management protocol standards body said. The COS co-develops and sponsors the development of conformance test tools, which it makes available to its members, Bolton said.



GM's Kaminski says his group has shifted focus from development to implementing new products

## ADDRESSING USER barriers to implementation of standards is a goal of the Users Alliance for Open Systems.

North American MAP/Top Users Group, Laurie Biele, manager of network architecture at Boeing Computer Services Co., called for raising users' OSI consciousness all the way up to the chief executive officer level.

"A lot of our efforts now are in getting vendors to build products and users to start implementing them," said Michael Kaminski, manager of computer

pen in their various environments. Kaminski noted, "The MAP [3.0] specification was finalized in 1988; it had products by mid-1989. It took until the middle of 1990 to get the first implementations going. That's where we are now," he added.

For North American MAP/Top Users Group plans this spring to "come out with an extension that will add function-

## Budget cutbacks will spare some markets

BY JOANIE M. WEXLER  
CW STAFF

Though the growth rate of corporate networking budgets is tumbling in tandem with overall information systems investments, there is fertile spending ground for equipment and services providing companies with quick paybacks, bottom-line business benefits or both.

According to Boston-based research firm The Yankee Group, markets that will enjoy the highest compound annual growth rate through 1991 will be enterprise-wide network management (48%), local-area network interconnection (42%) and video equipment and services (40%).

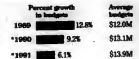
One reason these markets will spiral is that they are still fairly untapped and have a long way to go before becoming saturated. However, users also flag these areas as either requiring relatively low investments in relation to their payback potential or as too tightly linked to busi-

ness goals for companies to survive without them.

For example, John Facibene, vice president of telecommunications at New York-based bro-

### Bare-bones budgets

The declining growth rate in the average communications budget parallels that of overall IS, though little ground exists in network management, LAN/intranet and video markets



Source: Yankee Group, 200 Fortune 1,000 firms

\*Forecast

CW Client Panel Mark

ness goals. Garban Ltd., recently implemented a LAN in its firm's San Francisco office. Facibene purchased gateways and bridges to interconnect the San Francisco LAN with the New York LAN over an existing T1 backbone network "as a cost-effective way to extend our trad-

ing-desk application."

Facibene explained that the interconnection equipment was less costly than building a separate real-time central processor for the San Francisco site. "LAN interconnection is one of our biggest growth areas," said Howard Hunter, corporate manager of telecommunications in the Tulsa, Okla., office of Los Angeles-based Occidental Petroleum Corp. "We're now implementing the first in a series of six or seven capital investment projects aimed at linking 50 to 75 LANs in the U.S."

He explained that the investment is necessary to his business to allow remote sites to communicate with corporate headquarters. He said this requirement is a pressure that has "recently arisen because our users view distributed networking as competitive."

Hunter commented that setting corporatewide standards has enabled him to save some cash and still meet those wide-area needs in tough economic times. "We have just gained a corporatewide agreement on which remote bridge to use

[from Croncom Corp.], he said, "and we've also standardized on [Novell, Inc.] LANs."

The high growth potential of systems to manage these wide-area networks may depend on users becoming convinced that the "right" product has finally arrived. Todd Degues, an analyst at The Yankee Group, said network management is where "there is the greatest need and the least capability."

### Vendor 'slalike'

A recent report from Cambridge, Mass.-based Forrester Research, Inc. described network management systems to date as a "slalike" for vendors. The report also states that computer giants IBM, Digital Equipment Corp., Hewlett-Packard Co. and AT&T have recouped less than half their network management investments.

At Occidental, Hunter said, "network management is a big unknown, because I don't believe anyone has yet brought out a product that warrants a \$300,000 to \$400,000 expenditure. The systems purport to be global networkwide systems but frankly, don't yet deliver."

Facibene cautioned, though, that "you certainly shouldn't scribble on network management

in the wide area; it's an investment that is as key as putting in the network itself." He said his cost-cutting measures in the brokerage industry pertain more to "getting away from providing carte blanche service and returning to the basics of what information is truly needed."

Another strategy in an economic downturn, Facibene added, is negotiating longer term networking contracts and avoiding "knee-jerk management" that is short-term oriented.

Degues said many companies are turning to video to save on travel and time. For example, he said, "J.C. Penney is saving hundreds of thousands of dollars a year by having their buyers view merchandise over a video network rather than traveling."

He added that the technology for both freeze-frame and full-motion video is "better and cheaper," and that a glut of available bandwidth makes video possible for many companies.

"Time is money," he said, "and it's worth more than airfare," Hunter said. He added that while he will remain "very, very cautious of the technology because it is still a substantial up-front investment," the company's myriad overseas divisions are video will ultimately help it.

# PC network tracks mobilized equipment

ON SITE

BY JIM NASH  
ON STAFF

OAKLAND, Calif. — Napoleonic generals had a saying: "The loss of a nail, the loss of an army." It means the littlest trifle — a horseshoe nail — can spell defeat when it is forgotten or deferred too late in a war.

George Bush-era generals hold the same concept dear; they just track their nails with worldwide networks of computers. Al-

though the process is aided by personal computers, bar codes, leased lines and miniframes, it remains an enormous task even without the risk of war.

Massive amounts of equipment were mobilized in August with little warning for Operation Desert Shield. It was up to information systems managers in the military to find out where equipment and provisions had to go, how it was going to get there and when it had to arrive. Military Traffic Management Command, part of the U.S. Department of

Defense, used its PC network to orchestrate what many consider history's largest and fastest military buildup.

With Desert Shield sweating out its fifth month, system administrators said they are satisfied with the network's performance. Brian Richards, microcomputer programmer officer for traffic management here, said few shortcomings have been uncovered.

He said an acute shortage of PCs quickly developed in August. "One day you had one computer with three people in a room using it and the next there were 15 people. That slowed things down somewhat."

Richards also pointed to preparation of reservists. Some needed crash courses in advanced versions of software such as Ashton-Tate Corp.'s dBase III and Lotus Development Corp.'s 1-2-3.

One of the most striking successes, he said, can be found at the Elouette Island Terminal near Jacksonville, Fla. That terminal had been vacant post war, but defense officials realized they needed a new terminal on the East Coast.

Three days after being designated the new terminal in August, it was linked and fully operational with standard and specialized communication devices, leading Edge Products, Inc. Model D PCs and Zenith Data Systems Z-248 PCs. Thirty-five cargo ships have since been loaded at the terminal.

In a sense, Elouette's first

days of production were the result of seven years of work. The traffic management division introduced its first network in 1983, linking three offices with little more than spreadsheet software. By the time Iraq invaded Kuwait, the system had evolved into a Novell, Inc.

the jobdone was available."

He said that officers on the road ran their commands largely by E-mail via portable PCs. They found that they could not afford to be out of the network.

But the network has also found supporters with those working closer to the actual ship-



Troop carriers at Oakland, Calif., army base resided for shipment

## Of mice and PCs

In one of the more striking changes that technology has brought to the administration of military planning, PCs and mice have replaced butcher paper sketches of how equipment is to be loaded on ships.

Charles Cann, a traffic management specialist at Oakland Army Base, recently demonstrated the art of fitting objects such as tanks, guns and troop carriers on massive U.S. Navy cargo vessels. What was once done with wax pencils and butcher paper is now completed with computer-generated graphics.

An electronic manifest is compared with the military's master cargo database stored on a Bull HN Information Systems, Inc. Level 6 miniframe at Oakland. Dimensions and weights of the equipment on the manifest are transferred to a PC, which contains the exact layout of a vessel's hold.

Using a mouse, military personnel place a silhouette of each item one by one within the ship's parameters. The application will not allow equipment to be stored on decks that are inaccessible or too small or for the equipment. A four-color printout is made and given to the ship's captain and the officer in charge of loading the machinery.

JIM NASH

## EDI user numbers growing stronger

BY GARY B. ANTHES  
ON STAFF

WASHINGTON, D.C. — Fulfilling decades-old predictions, companies are beginning to embrace electronic data interchange in significant numbers, but users are walking the EDI path slowly and are finding it marked by pitfalls as well as promises, according to experts at a recent trade show here.

"EDI should be growing faster than it is," said Thomas P. Colberg, a partner in Price Waterhouse's EDI Consulting Group. "Frankly, it's embarrassing to be an expert on EDI and to forecast explosive growth year after year after year."

But if recent trends continue, Colberg may soon recover from his embarrassment. According to Dallas-based EDI consulting firm Speller's Word the number of companies worldwide using EDI — the electronic exchange of business information

between companies in a standard format — is growing at 45% annually — almost growth if not exactly an explosion. The number of U.S. companies appearing in the firm's directory of EDI users increased to 9,400 in August, 19% more than the 7,888 that appeared seven months earlier and 94% more than were listed 14 months ago.

While the number of users is rising rapidly, most have automated only a small number of transactions for a handful of key customers or vendors. Speaking at the Electronic Data Interchange Association's 22nd national conference, Colberg quoted a study showing that the average number of trading partners for firms that have embraced EDI is just 33. "The biggest obstacle is the lack of readiness on the part of trading partners," he said.

But a consensus of EDI users and would-be implementers at the conference revealed an even

bigger problem. Efforts fail to the degree that firms underestimate how much work is involved in EDI implementations and to the extent that they approach EDI as a narrow technical exercise. "EDI is a culture change on the order of *perestroika*. Technology plays a significant but supporting role," Colberg said.

The mistake people make is focusing on EDI as a technology, not on overall corporate goals," said Helger G. Ericsson Jr., senior group purchasing manager at Digital Equipment Corp. "We at Digital don't talk about the cost of implementing EDI; we talk about the cost of implementing things like just-in-time and total quality control."

Ericsson said a company should take a top-down look at the way it does business and let EDI follow rather than lead a comprehensive business strategy. For example, in discussing electronic funds transfer with a bank, a firm implementing EDI

should ask whether the bank should be doing the company's accounts payable, Ericsson said. "I could take off my shirt and show you how much work is involved in EDI," he said. "I didn't start to think about these things early enough."

Sears, Roebuck & Co. has taken EDI further than most companies since 1968, when it transmitted its first digital order to a supplier. Now the retailing giant supports 10 EDI transaction sets and swaps 1.4 terabytes of data per month with 700 suppliers.

But Sears struggled to get there. R.J. Ferkenhoff, information services vice president, said his company's keynote address. "Our early attempts at implementing EDI were difficult and slow... We found that talking about EDI was far easier than the actual implementation."

EDI grows because that top management involvement is essential. "You have to get the right people involved from the beginning — in particular, non-technical senior managers," said Jack Shaw, president of EDI

Strategies, Inc. in Marietta, Ga. "It doesn't have to be a lot, maybe an hour a month or a half-day a quarter, but you cannot possibly succeed without it."

Shaw said as a rule of thumb, companies might expect to spend 1% of one year's sales over three to five years for a comprehensive EDI implementation. But, he said, a return on investment of 100% per year is not out of the question.

Colberg said a typical firm should plan to spend \$1 million plus for EDI and could expect a return as high as 5% of sales.

In a comment from the audience to an EDI expert panel, Jane Heale, EDI systems designer at Eastman Kodak Co., said the hardest technical challenge is not dealing with EDI per se, but with the need to make extensive changes to applications, many of them old and complex, in order to get the benefits of EDI.

To that Shaw responded, "Make those systems, don't make incremental changes."

Colberg advised, "Obstacles, don't automate."

# MANAGER'S JOURNAL

## EXECUTIVE TRACK



Judith A. Campbell has been named director of business process in the information management department at Xerox Corp. in Rochester, N.Y.

She is responsible for driving business architecture and business process activities to position Xerox to respond to competitive pressures.

Campbell joined Xerox in 1977 as a technical consultant in the General Services Division. She was most recently manager of strategic technology deployment in corporate information management.

Campbell holds a master's degree in history from Columbia University.

Henryk Starecki has been promoted to director of information systems at Volvo Finance North America, Inc. in Rockledge, N.J., the leasing subsidiary of Volvo North America Corp.

Starecki was previously computer systems manager in the IS department. Before joining Volvo Finance, Starecki worked for Volvo Car Corp. and Volvo Data Corp. in Gothenburg, Sweden.

Donald Jackson has been promoted to corporate vice president of IS at Computer Products, Inc. in Boca Raton, Fla.

Jackson, 47, was previously director of systems and chief information officer. He manages all of the IS activities at the \$120 million firm.

Before joining Computer Products, Jackson spent 18 years with Unisys Corp.

### Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo to have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

## SECTION FEATURE: BATTLE-SCARRED EXECUTIVES

# Putting IS career crises in perspective

BY ALAN J. RYAN  
CW STAFF

Larry Betsinger's career baggage includes the stinging memory of the day 20 years ago when he was fired from the company he had worked at for 17 years.

Betsinger had clashed frequently with his boss, who regarded Betsinger's methods in carrying out a mandated centralization of information systems as too heavy-handed. Still, because he knew that his skills were held in high esteem, the possibility of unemployment with a young family to support had never crossed his mind.

"I was stunned," he says, adding that the real culprit wasn't his boss but his own bullheadedness and lack of political finesse.

Few people in any profession reach executive rank without a few battle scars, and IS professionals are no exception. Most IS veterans have been through more than one skirmish. Sometimes the opponent is a boss, sometimes a peer. Occasionally, as in the case of having to fire people, the fight is internal. Win or lose, they say, overcoming the trauma can be a boon to career growth and maturity.

In hindsight, Betsinger says, he learned a great deal through being fired from his job running that company's computer systems. His resentment toward his former employer faded quickly, and within six weeks of losing his

job, he had a better position at another company.

Perhaps more importantly, Betsinger, who is now MIS director at UJB Financial Corp. in Princeton, N.J., says being fired taught him important lessons in how to deal with superiors, subordinates and users of the systems for which he provides support. Even if he has a strong opinion on a topic, he says he makes sure he listens to the opposing ideas. And he no longer crams his ideas down the throats of others.

Betsinger also believes the firing did him good in a more material way. If he hadn't been dismissed, he says, he might have spent his entire career at one company and made a lot less money. "The only way I got to being a big shot and making lots of money was because I got fired," he says.

That doesn't mean, however, that Betsinger is in total agreement with his old boss. He has come up against some Young Turks who were just as stubborn as he used to be, he says. And, in nine cases out of



In hindsight, UJB Financial's Betsinger reflects that being fired was a necessary setback in his climb to the top

10, he's been able to work the problems out. Betsinger's example is far from unique, says Norm Sanders, managing director at executive search firm Russell Reynolds Associates in Haslet, N.J., although conflicts with bosses that result in firings represent a much smaller percentage of his business than job switches resulting from clashes with other line managers.

Sometimes such problems can be resolved with a little

*Continued on page 52*

## Recession won't cool demand for talent

BY CLINTON WILDER  
CW STAFF

John J. Davis may not be Santa Claus, but he does have some hints of comfort and joy for high-level information systems executives facing the U.S. recession.

Davis, president of New York-based IS executive search firm John J. Davis & Associates, Inc., said demand for top IS talent remains as strong as ever, and he sees no change in that demand—or in IS executive salary levels—in the coming year.

"When a company needs this kind of talent, we have not seen them balk at

paying what it takes to get that talent," Davis said. "I don't see that changing as this so-called recession deepens."

The increasing pressure on IS departments to scrutinize expenditures or, in many cases, to cut them, may in fact increase the demand for the best IS executives. The executives who have proven that they can do more with less will be sought-after candidates in a recession, Davis said.

"If you can bring some unique skills to the marketplace and back them up with de facto proof that you have been able to execute, you will be in demand," he said.

Davis said he sees robust demand

continuing for senior IS managers, strategic planners and telecommunications executives. The hottest area of all, however, may be computer security and risk management, where more and more companies have focused attention in the past two years, according to Davis.

The two job categories tracked by Davis that will have weak or flat demand in 1991 are chief technology architects (because the job is limited to only the very largest companies) and vice presidents of communications planning. "The demand is simply weak there, and we're not sure why," Davis said. "With the distribution of technology out to the users, you would think that more networking experts would be in demand, but we haven't seen that."



# SUN PROUDLY ANNOUNCES THE ULTIMATE STRIVING MACHINE.

SPARCstation™ 2. If you have people in your company who think limits were made to be exceeded, this is their kind of machine.

After all, it completely exceeds all our own limits. Last year, our SPARCstation 1 broke every record for price and performance. And became the best-selling workstation in history. But we went back to the drawing board. And created the SPARCstation 2 line.

---

#### POWER YOU CAN ACTUALLY USE.

---

To begin with, it gives you twice

the performance. For about the same price. 28.5 MIPS. 21 SPECmarks. And 4.2 MFLOPS. There's also up to 96MB of RAM. And as much as 76GB of mass storage.

But more than just a hot engine, we give your people everything else they need to do their jobs. Unbelievably real graphics. Easy networking. And a huge selection of software.

And when you put all that together, you get the kind of power that people can actually use.

---

#### THE WHOLE LINE IS AWESOME. THE PRICES AREN'T.

---

Just look at SPARCstation 2GX. It delivers ultra-high speed at no extra cost. So it's ideal for electronic publishing. Financial analysis. And for electrical and mechanical designers who work with 2-D and 3-D wire-frame drawings.

And that's just the most basic color model. We've also built SPARCstation 2GS. It lets mechanical designers and scientists create 3-D solid images in



24-bit true color. It's the kind of tool people absolutely hate to share. And from now on, they won't have to.

At the high end, there's SPARCstation 2GT. It does all the above, but it runs five times faster than the GS. And gives designers and engineers a level of image quality they've never seen at anywhere close to its price.

**THE WHOLE THING MAKES  
PERFECT STRATEGIC SENSE.**

At Sun, we make a full line of SPARC-based systems. From the

lowest-cost RISC/UNIX® workstation in the world to servers that support hundreds of users. They're built to run the most widely accepted standards for workstations.

So they'll fit right in with your current equipment. And help your people get the information they need.

On the subject of software, there are more than 2100 SPARCware™ applications. Including the most popular PC software.

And with the OPEN LOOK® interface, your people will spend less

time learning to use the system. And more time on their real jobs.

If you'd like to know more, call us at 1-800-821-4643. (From California, 1-800-821-4642.)

And we'll give your people what they've been striving for.

A better machine to strive with.



**sun**  
microsystems

*Computers that network people.™*

## BOOK REVIEW

## Setting up strategic plans that really work

## STRATEGIC CHOICES: SUPREMACY, SURVIVAL, OR SAYONARA

By Kenneth Primocino, Edward Primocino and Joe Lehen  
McGraw-Hill, 272 pp., \$24.95

What type of management book do you suppose two longtime IBMers and a consultant would write? It is not hard to imagine that the book would offer successful examples of strategic planning — a mandatory, sometimes feared and often asproductive business ritual. Throw in a lesson on thinking differently while exploiting technology, and strategic action begins.

*Strategic Choices: Supremacy, Survival, or Sayonara* by Kenneth and Edward Primocino and Joe Lehen, does not offer the usual recipe for success: Add one part luck, two parts hard work and keep an eye on the competi-

tion for good measure.

What the authors do recommend in this short but jam-packed business book is a comprehensive five-step plan that incorporates vision, tactics to implement that vision and corporate-wide follow-through.

Technology is the glue, they say, that helps the plan work. "Long-term success will be determined by how well [an organization] is able to capture, manipulate, exchange, manage and use information as a strategic tool," the authors write.

A strategic plan is not simple — it commands everyone's complete understanding and belief in all organizational policies and programs, with top management setting the tone and the vision.

## Can I get there from here?

The authors argue that while most companies think today's business environment has "a lack of road maps" with which to guide strategic progress, it is the wise company that follows the pattern set by innovators such as Apple Computer, Inc. and American Airlines. This involves incorporating technology and strategy to reach a "new level of organizational effectiveness."

The authors challenge company executives (information systems managers, take note) to answer the question: "Is my organization's competitiveness substantial and sustainable?" in relation to others in its specific industry? The successful strategic thinking process begins when this question is answered.

The authors recommend that organizations use a "new set of lenses" to examine themselves. This new way of looking at things can reveal the "linkages" between business functions and processes, as well as ties between the business and its extended enterprises.

Using these "new lenses" will enhance the organization's ability to exploit current "waves of innovation." But the authors warn that unless the company's strategic vision is clear, pursuit of innovation can be costly. It can lead to a loss of power and a bad business image.

Part I of *Strategic Choices* helps readers formulate their vision. It outlines a "linkage analy-

sis planning" technique showing readers how to chart an organization's "extended enterprise" — suppliers, distributors, customers and so on. In this way, companies can focus attention and resources on the links between business functions and processes.

This "electronic channel" thrives on technology-enabled information change, which helps each member survive. "Technology applied to information channels will have a major impact on organizations in the 1990s," the authors state. They devote a substantial part of the book to such technology, called "electronic channel support systems (ECSS)." ECSSs are important as systems "that enable an organization to electrically create, distribute and present information or knowledge" to the extended enterprise. The goal is to reach the end user before the competition does.

Parts II and III of the book continue the linkage analysis planning theme in which the

firm's vision is linked to strategy and tactics that help implement the vision. Top executives are warned to "make no assumptions" when considering strategic formation. Management and operations personnel are advised to channel their strategic vision throughout the organization and extended enterprise.

The book's strength is in its examples of successful strategies, such as Federal Express Corp., which used strategic planning to change the rules of the game in the delivery industry. Two appendices are devoted to linkage analysis planning examples from industries such as health care and education.

The plan the book offers is not foolproof — each member of an organization must tie individual goals closely to corporate goals or the organization's strategic vision becomes meaningless. But *Strategic Choices* is worth the investment for would-be visionary leaders. The ideas presented between its covers may become the backbone of strategic planning in the 1990s.

HAULINE SMITH

Smith is a Computerworld senior account executive.



## Crises

FROM PAGE 49

accommodation. Gary S. Lynch, a regional manager at Pyramid Development Corp., recalls one example from his former career as a vice president and manager of corporate information security at a large New York brokerage house.

Constantly stymied by a high-level user in a very data-sensitive area who told him that he had neither the time nor the inclination to discuss security for his personal computer, Lynch says he decided to change his timing and waited until 10:30 one night to meet with the user.

Persistence and the willingness to make his arguments at

the user's convenience did the trick. "He became our greatest supporter," Lynch says.

## Tougher fights

Other disagreements are more intractable, however. Sanders tells the story of a face-off between an IS manager and a risk-taking line manager who wanted to invest half a million dollars on unproven information technology.

The IS manager felt that the amount was too small to provide any real benefit and too much to spend on a test. "They reached a logjam," Sanders says, and in the end, the IS manager was fired. Frequently, the outcome of such stalemates is not firing but a mounting frustration that eventually leads to voluntary departure by one of the parties.

Michael Simmons, executive vice president of technology and operations at Bank of Boston, says there is usually some way to work with adversaries, and the best way is to try to understand them by walking in their shoes.

Lynch agrees that understanding is desirable but adds that it doesn't always produce acceptable compromises. That, he says, is one of the reasons he decided to switch to a job with a vendor.

One situation where understanding did not lead to compromise, Lynch recalls, involved a senior IS development manager who "was absolutely, incredibly against security." Lynch did discover, upon investigation, that the manager had some under-

standable reasons for opposing new security measures.

The proposed changes would have required the development group to create new interfaces, delaying delivery on a number of systems. The manager felt that delayed products would make him look foolish, Lynch says, and that the security interfaces would complicate the lives of users.

"My goal was to secure system," Lynch says. "His goal was to have the systems in the users' hands." It was, and remained, a stalemate.

**Disaffection and change** Simmons, who changed jobs three times during the 1980s, says anyone who leaves a job does it because of dissatisfaction or for a better opportunity. He has found himself in both circumstances, he says.

Simmons says most of the battles any executive faces are politically oriented. "An individual who wants to be something else in the organization will use anybody else in the organization to get there," whether it involves stealing ideas or using others to climb to the top. Simmons calls that type of worker an "empty suit" and says he's run into many during his career. Bettsinger says he's run into that type of worker, too, but he's learned that more often than not, that person will eventually

get this or her comeuppance.

"Sooner or later, those people simply can't survive," Bettsinger says. And, sooner or later, Lynch adds, the savvy IS manager also learns to share more carefully. Of course, the thing that really matters is the company gets the benefit of the idea, no matter who gets the credit. But credit is also nice, and "as you mature, you learn to let some of the ideas out of the bag but not all of the facts," Lynch says.

No matter whose idea it was, when a system fails, the buck stops at the IS chief's desk. Handling that kind of situation is one of the most traumatic experiences a manager is likely to face.

Avery Cloud, manager of technical service in the IS department at Bowman Gray/Beaumont Hospital in Winston-Salem, N.C., says that when inexperienced, among his technical staff led to the failure of a system critical to the business, he took a lot of heat.

Back in the IS office, Cloud distributed the heat to those who deserved it. He wanted the unfortunate situation to show the workers how to work in a crisis situation. "I tried to create a nonthreatening environment and let them feel they had a right to fail," Cloud says. "If it's the first failure, it's easier to take. But don't do the same thing twice."



Cloud was hurt by technical staff's lack of experience.

## Dealing with adversaries

While each case must be handled on an individual basis, IS managers who have had to work with adversaries say the following techniques can help defuse conflict and minimize career damage in more than 90% of such encounters:

- Examine the adversarial relationship from the adversary's point of view. There may be cause there as to why that person is fighting you (your demands may be creating more work for him, for example).
- Take time to develop a solution that will work for both parties. That may mean avoiding the adversary by having one of your employees work with one of his employees. It can also mean finding the common ground where both

parties agree to be more flexible and professional.

- Try to be friends, but do not make that your life mission. There are some personalities that will always clash; accept it and get on with your job.
- Get the job done. Under certain circumstances, that may mean taking a subordinating role to a peer, but the top priority must be work, not ego or submissiveness.
- If all else fails, get tough. Sometimes it comes down to you or the adversary's job. If the adversary is a superior, you may be better off finding another position. If it is a peer, one of you may have to go. If it is a subordinate, the only solution may be to fire that person.

ALAN J. RYAN



# PRODUCT SPOTLIGHT

## CLIENT/SERVER PRODUCTS

### Every which way but easy

BY BARBARA BOCHENSKI

**A**nyone who has navigated the jumble of client/server definitions and product offerings has probably emerged feeling a bit like a mouse lured into a maze containing small morsels of every conceivable kind of cheese.

The variety is enticing, but it's also disorienting and frustrating. Experts say users could find themselves bumping into dead ends as they try to design client/server systems. The same consultants are upbeat about this and other network computing architectures. However, they warn, there are some important components missing.

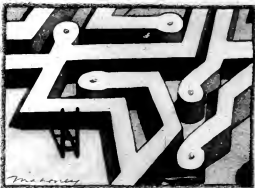
Part of the problem is the vagueness surrounding the term. One way to attempt understanding it is through a consensus of various definitions.

Several experts polled agree that the following five points are needed in a client/server architecture (in other words, if these features are not present, you have something, but you don't have a client/server architecture):

- A client end and a server end that can be distinguished from each other yet interact seamlessly.
- The client portion and the server portion can operate on separate computer platforms, but they don't have to.
- Either the client or the server hardware platform can be upgraded without having to upgrade the other platform.
- The server is able to service multiple clients concurrently.
- The client/server system includes networking capability.

That is the extent of the agreement. Even these requirements — save the first — came with at least some qualification.

Bochenksi, a 30-year veteran in IS, is a free-lance writer and advanced computing consultant in Bellevue, Wash.



For instance, while the client portion usually operates on a personal computer, experts say, the server portion can reside on a powerful workstation, dedicated server hardware, a minicomputer or even a mainframe. However, it is also possible for a client and server to function on the same hardware platform.

"The capability to install the client process and the server process on two separate platforms must be present for a product to qualify as a client/server," says Dave McGovern, partner and co-founder of Database Associates in Morgan Hill, Calif. "However, the end user need not exercise that option."

The distinction that only the option needs to exist applies to "networking capability" as well. However, none of the experts could agree on what was meant by "networking capability." For most of them, it meant that the architectural components communicate over a local-area net-

work. Others note that client/server LAN configurations are increasingly being connected to metropolitan- and wide-area networks, which install them with more power and complexity.

There are four more requirements that many of the analysts listed but did not all agree on. These "debatable" requirements are as follows:

- Action is initiated at the client end. Some people argue that database servers can be programmed to trigger action at a certain time each day.
- A user-friendly graphical user interface should reside at the client end. Others say this is not a requirement.
- The database server should provide data protection, security and SQL capability.

Most experts say a database server should support SQL because of its standing as a de facto standard. "Information Builders' Focus claims to have a client/server architecture, but it

doesn't," says Richard Finkelstein, president of Performance Computing, Inc. in Chicago.

On the other hand, says George Schussel, president of Digital Computing, Inc. in Andover, Mass., Focus can be considered among the ranks of client/server products because it divides the processing of a transaction between two platforms.

• A significant portion, or all, of the application logic resides at the client end.

Most consultants concur that the application logic should reside in the client end. The application on the client end controls the management

and data manipulation, while the database server handles the transaction logic and data integrity, Schussel says.

Others disagree. "If the workstation end has any intelligence, then that is a cooperative processing system," says John Dunkle, vice president at Workgroup Technologies in Hampton, N.H.

This brings us to another source of confusion: the difference between client/server, cooperative processing, distributed processing, distributed databases and network computing. As far as some people are concerned, client/server and cooperative processing are synonymous. Others find the distinguishing factor to be the involvement of a mainframe as the server. Others look to IBM.

"The rest of the world was using the term 'client/server,' and IBM introduced the term 'cooperative processing,'" says software guru James Martin.

In fact, cooperative processing now falls under IBM's recently formed Client/Server Computing Group. This would seem to indicate that IBM is now placing more emphasis on client/server architecture than on cooperative processing.

"The Client/Server Computing group was formed to ensure a cohesive strategy throughout

Continued on page 54

### INSIDE

#### Tips, Rules, Guidelines

What you need to know about client tools, server tools and network operating systems. Page 55.

#### Product Guide

A comprehensive listing of portable front-end application development tools. Page 59.

Continued from page 53

IBM," says Dick Newman, manager of planning for the IBM group. "In both client/server and cooperative processing, the application is spread between the workstation and the host. In cooperative processing, most of the processing is done on the host. In client/server processing, most of the processing is done on the workstation."

Most analysts agree that client/server systems can be considered a subset of distributed processing. However, they warn, you should never assume that client/server systems are distributed database systems.

Distributed systems require various transparency capabilities as well as adequate recovery management. Adequate recovery management and the handling of two-phase commitments have posed

by the middle of 1991 that will handle many of the problems currently faced by systems that try to do distributed database operations.

According to Martin, a new breed of software that he refers to as a "client/server management system" will address transaction processing as opposed to just queries, ensuring that transactions are not lost upon failures occur.

A vendor that specializes in such software, he says, is Cooperative Solutions, Inc. in San Jose, Calif. The firm plans to announce a product in the first quarter of 1991 that would generate transaction-based systems on a LAN using a client/server architecture. The monitor would provide the same services now available in a mainframe transaction monitor, says

Frank Clegage, director of product marketing at Cooperative Solutions.

"Today's software has some of the capabilities needed on the database end, but the application end doesn't," Clegage says. "The database vendor will say that when an error occurs and we need to roll back, they take care of all that. Well, they do — on the database side. But the application is not taken care of, since it's now partly running on the client."

Another major concern is systems administration. Many large companies are starting to move into IBM's System Managed Storage to manage their vast storage needs.

In addition, people are wondering how they will distribute and refresh the client software sitting on multiple workstations.

IBM's recently announced Systemview strategy has promised to address client/server system administration issues. However, it is doubtful if the strength and quality of products will be ready when people start to need them.

Despite these concerns and the confusion over definitions, firms are moving in the direction of what they consider to be a client/server architecture — whether that is a "true" client/server architecture or their own version of it.

"Big companies who are heavily into client/server have shut up about it" to keep a hold on what they consider prime technology, says Larry DeBoever, president of DeBoever and Associates. "They know it gives them tremendous competitive advantage." \*

## Buyer beware

What kinds of products exist that support client/server systems? You can break them into three categories: client tools (fourth-generation languages and application development packages), database servers and local-area network operating systems (see story page 55).

In all three categories, however, the rule is "buyer beware." Just because a product is linking up to a back-end server does not mean that it performs well or that it's easy to use," says Richard Finkelstein, president of Performance Computing, Inc. in Chicago.

Some of the biggest challenges to vendors trying to deliver these systems:

Some vendors market their client/server systems as also having distributed database systems. However, in most of those cases, the product is the current version of distributed database that they've been working on for years.

### Not quite there

Most consultants say client/server architecture is unprepared to perform distributed database functions. Martin says, "With a client/server architecture, you're talking about two devices interacting. With distributed database processing, that number could be in the hundreds."

The other concern is the concept of a "unit of work," a term used in distributed database systems to indicate all the work that must be accomplished before a transaction can be committed. If any portion of the unit of work on any portion of the distributed database fails, all portions of the unit of work must be rolled back.

"Remote procedure calls (RPC) are the classical way to implement client/server architectures and have no notion of a unit of work," says John Tibbetts, president of Kinetics, a consulting firm in San Francisco. "When it comes time to commit work in a distributed database system, you have to have a peer-to-peer protocol. You could use the client/server RPC to prepare the transaction and a peer-to-peer protocol to commit or roll it back."

Members of the Transaction Processing standards committee, sponsored by the International Standards Organization and ANSI, say a standard will be ready

© 1991 NYNEX Corporation



All too often, the technology that's allowed you to acquire so much information also dictates how you can use it.

But unless you're free to manage, access and share information the way you want to, you're not getting the most from your information system.

That's where NYNEX<sup>®</sup> comes in.

Because we're involved in virtually every aspect of the Information Industry, we can give you an unbounded look at the whole picture.

From cellular to software, from hardware to high-speed data highways, from

## Avoid bad buys by following rules of thumb

### CLIENT TOOLS

Features traditionally considered ideal in application development tools may not be so relevant in a client/server architecture. Todd Johnson, a consultant at Lante Corp. in Chicago, says to choose a tool for the newer setup, you may want to look at the following in a new light:

- The user interface. The tool should

allow tight control over the look-and-feel aspects of the user interface, and there should be custom procedures to validate data values for an individual data field.

The developer also needs to be able to modify portions of the user interface throughout the development cycle, independent of changes to other portions of the program code.

The front-end tool should insulate the developer from the system calls necessary to produce the display. High-level functions to produce list boxes, radio buttons, push buttons, pull-down menus and other standard interface components should be well integrated into the development environment. Some tools provide spreadsheet and text-edit-



ing objects, such as Gupta Technologies, Inc.'s SQL Windows, Jyacc, Inc.'s JAM and Borland International, Inc.'s Paradox. An access path should also be provided to let the developer access system-level calls to customize the functions.

• Close integration of the front-end environment with the database server. Back-end functions are usually accessed via an application programming interface (API) provided by the vendor. Many front-end tools allow the application to call these APIs directly; however, fourth-generation languages eliminate them. For example, some tools can take the results of a database query and place them directly into a user interface object. Paradox and

SQL Windows provide these types of functions.

• Reporting facilities. Simple report layouts and calculations should not require extensive programming, so look for a tool that inherently supports the SQL language aggregate operators. Don't overlook multiple font and graphics output capabilities. Paradox 3.5 contains exceptional report-generation facilities.

• Platform portability. Portability should exist at both the front and back end of the application so that users can choose the database platform that best suits the needs of the current application. Several front-end tools support multiple graphical user interface environments, such as Easel Corp.'s Easel and Channel Computing, Inc.'s Forest & Trees, which are both available for Microsoft Corp.'s Windows and Presentation Manager.

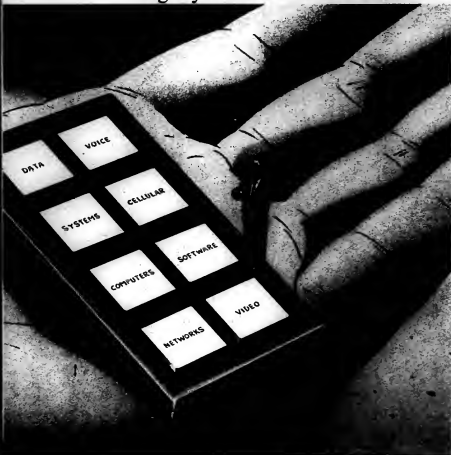
• External function calls. The development tool is most useful if it contains a facility to make calls to code written outside of the native environment. This allows the application to take advantage of existing code libraries, reducing development time and allowing for code reusability. This also lets the developer write critical portions of the application in C or assembler for faster performance.

• Interfaces to other applications. The application should share data with other standard applications. Data from the client/server application can be written to standard file formats to be read by the standard applications.

• Licensing costs. Most vendors provide a standard developer package, allowing any number of developers to use the tool. Sometimes, a separate license must be purchased for each developer. SQL Windows and Easel require a runtime environment to execute the completed application. You may need to purchase a runtime license for every workstation.

For a list of portable application development tools, see page 53. ■

## We give you freedom of information.



token rings to teleconferencing, from video to voice recognition, we offer the kind of freedom of choice in solutions that can really free up your information.

That's why scores of businesses, institutions and governments around the world have come to depend on NYNEX for their

information needs. Call us at 1 800 535-1535. For solutions that will set you free.

*Need to communicate? Need to compute? The answer is*

# NYNEX

### SERVER TOOLS

Choosing the wrong database server can mean cost overruns and even canceled projects, says Richard Pinkstein, president of Performance Computing, Inc., a database management system consulting firm in Chicago. Some simple guidelines may help you avoid common mistakes:

• **Rule 1: Stored procedures minimize network traffic.** With stored procedures, the application issues only one command to execute a procedure. Good implementations are found on the Microsoft Corp./Sybase, Inc. SQL Server, Ingres Corp.'s Ingres server and IBM's OS/2 Extended Edition Database Manager.

• **Rule 2: Look for a cost-based query optimizer.** Query optimizers use statistics stored in the system catalog to determine the fastest way to retrieve data. All OS/2 database servers except for Oracle Systems Corp. use statistically-based optimization. Ingres and OS/2 Database Manager are particularly strong in this area.

• **Rule 3: The database needs to enforce integrity consistently across all client applications.** Referential integrity is the best way of doing this, and it can be implemented in two ways. IBM's OS/2 Extended Edition Database Manager and Digital Equipment Corp.'s RDB/VMS incorporate it in the SQL CREATE TABLE command of the data definition language.

SQL Server and Ingres use "triggers"

Continued on page 58



# "We've got a complete SAA system up and running, and it's hard to say who's happiest: our programmers, our users, our customers, or me."

Keith Sievers, VP/Information Systems and Treasurer,  
Federal Kemper Insurance Company

Federal Kemper Insurance Company is a home and auto insurer who's found some insurance for themselves, against system obsolescence. It's a policy called SAA," or IBM Systems Application Architecture."

Their SAA system is a client-server approach that ties IBM PS/2's running OS/2" (in remote locations and the home office) with an ES/3090™ host. They chose SAA for both short- and long-term advantage.

"In our business," says Keith Sievers, "there's a tremendous need to cut costs, to make everybody as useful as possible. SAA is helping us do that. We also need a platform that's consistent, easy to manage, and built for growth. For us, going with SAA was just the obvious thing to do." **For programmers.**

The first people to notice an improvement were FK's programmers.

"We did everything in COBOL, but in the Presentation Manager™ environment," says Keith. "All of a sudden, people who'd been here for years were driving to work a little faster. They were doing better work, they were making a difference, and they saw results quickly, even without CASE tools."

FKI now has applications for data, image and customer service that are easy to use and easily portable. And they're delivering more function to users at less cost, thanks to SAA's cooperative processing.

Says Keith, "Under SAA, we're moving a lot of our processing from the mainframe to PCs, which offer flexibility and portability. And we see real benefits from a disaster recovery standpoint."

## For users.

And do users like it?

"They ought to," says Mr. Sievers, "they helped us design it. SAA screens are sort of a personal thing, so it only made sense to include the people who'd be using them every day. Our old screens had acronyms tucked into every available space. The new ones are a lot easier to look at and understand, and everybody loves the mouse. It's less like work and more like fun."

And while multitasking doesn't mean much to the public, it's going to be a real plus for FK's customers.

## For customers.

"When policyholders call with questions, they want answers fast. And when our SAA system is fully implemented, they'll get them. Our representatives will be able to solve problems on the spot just by popping a new window onto the screen. Instead of 'I'll get back to you later,' they'll say 'Here's the answer right now.'"

Keith Sievers has other reasons for liking SAA, especially since MIS isn't his only job. He's also the company treasurer.

"We wanted a leading-edge system that would still be leading-edge five years from now, a base we could build on, something we could enhance with AI, voice or image technology, but without having to toss out what we already owned. People ask questions about SAA, but of all the options we explored it was easily the least questionable."

"We're very competitive, and the truth is, only two things separate insurance companies—cost and service. SAA gives us an edge both ways."



Continued from page 55

to enforce referential integrity. A trigger is a set of procedural and SQL commands that automatically executes whenever a table is modified. The first option is more reliable because it is developed and tested by the DBMS vendor.

• **Rule 4: Embedded SQL commands are preferable to function calls in application programming interfaces.** Most SQL database servers use this approach, but XDB has carried it one step further. Because it supports DB2's syntax, error codes, data types and semantics, it is an excellent DBMS for developing DB2 applications on a personal computer platform. OS/2 Extended Edition also has a very high degree of conformance.

• **Rule 5: Database server architecture**

will have a substantial effect on resource utilization. On multithreaded/single-server machines, one SQL statement runs on the computer, and a thread is created by the server for each user connection. SQL Server and Gupta Technologies, Inc.'s Sphbase are two examples of this type.

Other servers, such as Oracle, use a process-per-user architecture, which creates a new process for each user connection. The downside to this architecture is that it requires more memory than threads and consumes more CPU resources. On the plus side, process-per-user servers can take advantage of multiprocessor hardware by distributing the process load across several processors.

Ingres combines both approaches with a multithreaded/multiserver architecture. These servers offer low resource consumption using multiple-processor computers by allocating servers to each of the available processors.

• **Rule 6: Just because it says "portable" doesn't mean it is.** Not all vendors support all platforms equally. For example, the VMS port of Oracle Version 6 supports Oracle's proprietary

PL/SQL language, while the OS/2 version does not. SQL Server Version 4.0 is available only on Unix platforms. The latest release of Ingres has been ported to several Unix platforms but is not available under OS/2 or other lightly supported Unix systems. •



## COMMUNICATIONS TOOLS

Deciding which network operating system is best for your client/server system depends primarily on the size of your company and the connectivity needs of your departments, according to Steven L. Guengerich, director of communications, and David A. Rhodes Jr., consultant, at Business Systems Group, Inc., a national systems integration firm in Houston.

If you've got 10 to 20 users with one file server, the network operating system should be able to run on the same file server as the database package. This requirement rules out Novell, Inc.'s Netware if you're planning to use Oracle Systems Corp.'s Oracle Server, Microsoft Corp.'s SQL Server or Gupta Technologies, Inc.'s Sphbase. All of these require a non-proprietary multitasking operating system such as OS/2 and Unix.

With IBM's LAN Server and Microsoft and 3Com Corp.'s LAN Manager, on the other hand, the file server can support both the network operating system and the database server.

### Separating the systems

If you have 50 or more users with more than one dedicated server, you can run the two systems on separate servers.

In this situation, Netware becomes more attractive. You can connect OS/2 machines running Oracle's Server for OS/2, SQL Server, Sphbase or Ingres Corp.'s Server for OS/2 to the network using Novell's Network Requester for OS/2. The Requester enables users to access the database server's resources via Novell's Sequenced Packet Exchange, Microsoft's Named Pipes or IBM's Netbios.

If your firm is large, ease of access to and management of databases across networks and platforms becomes a priority.

In these environments, systems such as Banyan Systems, Inc.'s Virtual Networking Software (Vines) often become the network operating system of choice. Because of its integrated StreetTalk global naming service, users can transparently access resources anywhere on the network.

Vines servers are Unix-based, however, so there are few database servers available to run on them. However, Oracle offers Oracle Server for Vines, and Vines users running DOS can use Netbios to access Sphbase. SQL Server supports only LAN Manager and Netware clients, but Named Pipes support for Vines is coming soon.

In large environments, it is also important to consider the network operating system's ability to expand into other systems, including Unix servers, minicomputers and mainframes.

Novell currently offers gateways for Netware into IBM 5250 minicomputers and 3270 mainframes, as well as Transmission Control Protocol/Internet Protocol for Unix networking. Other third-party vendors — including AST Research, Inc., Digital Communications Associates, Inc. and Racial Interlink, Inc. — offer similar gateways.

Microsoft and Digital Communications Associates have teamed up to create the DCA/Microsoft Communications Server to run as a server-based application with LAN Manager. IBM's OS/2 Extended Edition also includes a communications manager for gateways into minicomputers and mainframes. •



## The Graphical Relational Database Management System That Does More Than Windows.

Want a clearer view of your organization's data? New Access SQL Version 1.1 makes it easy.

Access SQL is a relational database management system (RDBMS) front-end that lets you access, manage, enter, and utilize valuable data from across your organization. Quickly and easily.

**Windows.** Thanks to the Microsoft® Windows graphical user interface, Access SQL is easy to use from day one. Pull-down menus and dialog boxes make any database operation simple and fast.

**Powerful SQL.** Access without complexity. Whether you are a novice user or a programmer, Access SQL provides simplicity while also providing tools robust enough to satisfy complex requirements. Build queries by simple point and click demands.

**Reports and Forms.** View and update databases via table format or customized forms, and create polished professional reports in a graphical environment.

**Client-Server Architecture.** Access SQL uses new client-server architecture to share computer chores between your PC and a centralized database server. This guarantees better performance through reduced traffic on the network and optimizes database speed.

**Flexibility.** Access SQL features complete SQL (Structured Query Language) support by utilizing a popular SQL database server. Database administration is a snap with user level access control, backup and restore, and powerful table management.

Access SQL will help you see your organization in a whole new light.

For more information and a free demo disk, call Software Products International at 800-937-4774 or 619-450-1528.



Software Products International  
10240 Sorrento Valley Road  
San Diego, CA 92121-1697  
1-800-937-4774

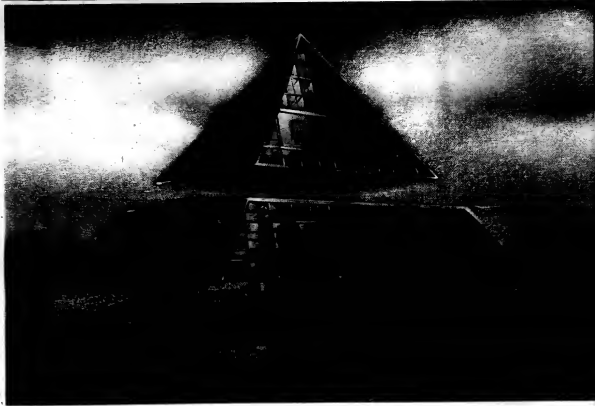
# Portable application development tools

VENDOR	PRODUCT	DATABASE SERVERS ACCESSED	CLIENT OPERATING SYSTEMS SUPPORTED	CLIENT HARDWARE SUPPORTED	PROGRAMMING LANGUAGE	GENERATORS INCLUDED	CALL LANGUAGES SUPPORTED	NETWORK OPERATING SYSTEMS SUPPORTED	RAM REQUIRED ON CLIENT	HARD DISK STORAGE REQUIRED	USER INTERFACE	PRICE	COST OF ADDITIONAL USERS
Mythic Software, Inc. (617) 877-6823	Omni 5	DEC Rdb, IBM DB2 and OS/2 DB Database Manager, Informix, Ingres, SQL Server, Oracle Server	DOS, Macintosh	Apple Macintosh Plus, Ilex 80386 and higher IBM PCs and compatibles	Clean Script	Application, form, report	Assembly, C, Pascal	Apple IIlex, any AFP or NetWare, LAN Manager, Novell Netware	1M on Apple Macintosh, 2M on PC	2M	Microsoft Windows, Apple Macintosh	\$1,000	\$200
Parsons International, Inc. (408) 430-8400	Paradox 3.5 with Paradox SQL Link	MSX Rdb, IBM OS/2 DB Database Manager, SQL Server, Oracle Server	OS/2	Intel 80386 and higher IBM PCs and compatibles	Turbo-C	Form, report	PAL (Paradox Application Language)	2Cam 3+ (2Cam, IBM LAN Server, LAN Manager, Novell Netware, Netware Views)	1M	1M	Character-based	\$795 for Paradox 3.5 plus \$295 - \$495 for SQL Link	\$195 for each additional user
Chimed Computing, Inc. (800) 669-3823	Paradot & Tools	Open Systems, SQL Server, Oracle Server	DOS	Intel 80386 and higher IBM PCs and compatibles	Close pop-up windows and menus	Application, report	3M*	IBM LAN Server and PC, LAN Manager, Novell Netware, Netware Views	1M on Intel 80386, 2M on 80486	2M on DOS, 4M for OS/2	Microsoft Windows, 3P New View	\$495 - \$2,995	\$495
Database International, Inc. (203) 374-8000 (800) 343-5123	Database SQL Professional Version 1.0	SQL Server	DOS, OS/2	Intel 80386 and higher IBM PCs and compatibles	Database	Application, form, report	Assembly, Basic, C, Cobol, Pascal	3Cam 3+ (2Cam, IBM LAN Manager, Novell Netware, Netware Views)	2M for DOS, 4M for OS/2	1M	Character-based	\$995 - \$1,995	\$1,750 per additional user
Bundles, Inc. (800) 943-8888 (617) 360-1488	Subscript 90	Omni Server	DOS	IBM PCs and compatibles	Logic	Application, report	Assembly, C	Any NetWare, LAN Manager, Novell Netware, Netware Views	500K	1.5M	Character-based	\$1,075 for developer license	\$720
East Corp. (617) 938-8445	Excel	IBM OS/2 DB Database Manager and OS/2, SQL Server	DOS, OS/2	Intel 80386-based IBM PCs and compatibles	Excel	Application, form	Basic, C, Cobol, Pascal	LAN Manager, Novell Netware, Netware Views	640K	400K	OS/2 PM	\$7,500	\$350
Goldman Technologies, Inc. (617) 391-1300	Chromographer	IBM OS/2 DB Database Manager, SQL Server, Oracle Server	DOS, OS/2	Intel 80386-based computers	Progeny 4GL	Application, form	Assembly, Basic, C, Cobol, Pascal	LAN Manager, Novell Netware	4M	2M	OS/2 PM, Microsoft Windows	\$7,500 for 4-developer license	\$750

What would it take  
to outperform DASD MON?

## PRODUCT SPOTLIGHT

VENDOR	PRODUCT	DATABASE SERVERS ACCESSED	CLIENT OPERATING SYSTEMS SUPPORTED	CLIENT HARDWARE SUPPORTED	PROGRAMMING LANGUAGE	GENERATORS INCLUDED	CALL LANGUAGES SUPPORTED	NONLOCAL OPERATING SYSTEMS SUPPORTED	RAM REQUIRED ON CLIENT	HARD DISK STORAGE REQUIRED	USER INTERFACE	PRICE	COST OF ADDITIONAL USES
Compu Technology, Inc. (610) 321-6900	SQL Windows	Oracle Software, IBM DB2 SQL Server, IBM DB2 Manager and DB2, Oracle Server	DB2	IBM PCs and compatibles	SAL, dBASE, SQL, Microsoft, Informatica	Application, Java, report	Assembly, C, Pascal	Any NetWare, Xcme 2+ Open, LAN Manager, Novell Networks, NetWare Version 3	12M, 256 recommended	1.2M	Microsoft Windows	\$1,200	\$150
	SQL Systems Programming Manager's Toolkit	IBM DB2 SQL Database Manager, IBM DB2 SQL Database Manager and DB2, Oracle Server	DB2, DB2	IBM PCs and compatibles	C, Cobol	Application	C, Cobol	Any NetWare, Xcme 2+ Open, LAN Manager, Novell Networks, NetWare Version 3	640K	3M	Character-based, IBM DB2 SQL Manager (C, API only)	\$800	\$800
Informatica Builders, Inc. (512) 726-6533	Focus	Paradox DB Server, IBM DB2 3.1 Database Manager, DB2 and SQL, dBase, SQL Server, Teradata, Microsoft	DB2, DB2/2	IBM PCs and compatibles, Unix workstation	Focus SQL	Application, Java, report	Ada, Assembly, Basic, C, Cobol, Pascal	Xcme 2+ Open, LAN Server, LAN Manager, Novell Networks, PCMA, Paradox Server	470K	5M	Character-based, DB2 PM, Microsoft Windows, CDF, NetWare, AT/AT Open Link	\$1,200 + \$1,450 per first user	\$1,200
Intelligent Business, Inc. (609) 646-1888	Applications Manager	IBM DB2 SQL Database Manager and SQL, dBase, DB2, SQL, dBase, SQL Server	DB2	Any workstation (using DOS)	AM HLL (high-level language)	Application, Java, report	C, Pascal	Xcme 2+ Open, LAN Server, LAN Manager, Novell Networks	4M	1M	CDI PM	\$5,000	\$500
JYACC, Inc. (310) 387-7723	JYACC Applications Manager (JAM)	SQL, SQL Server and Rel. Query Software, DB2, Informatica, Ingres, SQL Server, Oracle, dBase, dBase Server, Progress, Share Base, dBase, dBase, dBase Server	DB2, DB2/2	IBM PCs and compatibles, various single- and multi-process, Amaloid	IBM PCs and compatibles	C	C, Cobol	DB2, dBase, LAN Manager, Novell Networks, dBase, dBase, dBase Server, Xcme 2+ Open, LAN Server, LAN Manager, Novell Networks, PCMA, Paradox Server	640K	4M	Character-based, ODF Model 3270	\$100 - \$20,000, depending on hardware	No per-client charge
MSBIS, Inc. (317) 647-1333	Object/1	IBM DB2 SQL Database Manager, Microsoft SQL Server	DB2, DB2/2	IBM DB2 and higher IBM PCs and compatibles	Object/1	Application, Java, report	Assembly, Basic, C, Cobol, Pascal	LAN Manager, Novell Networks	4M	6M	OS/2 PM, Microsoft Windows	\$900	No per-client charge
Thomco Data (415) 321-4488	Support Object	Adaptive Tree Object SQL, DB2, Rel. Generator Object, dBase and SQL, dBase, Informatica, Ingres, Oracle Server, SQL Server	DB2, DB2/2	IBM PCs and compatibles, Unix workstation, VMS machines, MVS machines	Support Basic and Objects	Application, Java, report, operators	Assembly, Basic, C, Cobol, Pascal	Any supported by the server	640K	1M	Character-based, IBM DB2 SQL Manager, Microsoft Windows	\$5,000 - \$20,000, no developer license	\$750 - \$50,000, can be sold by licensee model
Program Software Corp. (800) 375-8260	Progress SQL/DB2/2	DB2, dBase and IBM, dBase Server, Progress	DB2, DB2/2	IBM DB2, DB2/2, Unix, VMS, MVS, Microsoft, VMS machines	Progress dBase	Application, Java, report	C	LAN Manager, Novell Networks, NFS, NetWare Version 3	640K	3M	Character-based, Microsoft Windows, dBase, dBase, dBase Manager	\$1,500 - \$190,000	NA





CLIENT/SERVER PRODUCTS  
PRODUCT SPOTLIGHT

VENDOR	PRODUCT	DATABASE SERVICES ACCESSED	CLIENT OPERATING SYSTEMS SUPPORTED	CLIENT HARDWARE SUPPORTED	PROGRAMMING LANGUAGE	GENERATORS INCLUDED	CALL LANGUAGES SUPPORTED	NETWORK OPERATING SYSTEMS SUPPORTED	RAM REQUIRED ON CLIENT	HARD DISK STORAGE REQUIRED	USER INTERFACE	PRICE	COST OF ADDITIONAL USERS
Simulation Technologies, Inc. (617) 666-1800	Advanced Simulation 3.0 with SQL Server Bind	SQL Server, Ashton-Tate dBase	DB2	IBM PC and compatibles	dBasis	Application, form, report	Assembly, C	LAV Manager, Novell Netware, Banyan Vines, Scan 3+ Client	640K, plus 128 expanded memory	None required	Character-based	\$995 for hardware	\$995 for base software
SQ Software (310) 993-6001	SQL, Easy SQL	Ingres, Oracle Server, SQL Server	PC-5, OS/2, Unix, VMS	More than 40 computers, including IBM PCs and compatibles, Unix workstations, DEC, HP and other mid-range machines	C	Report	Assembly, C, Cobol, Pascal	LAV Manager, Oracle SQL, Net	400K for DOS, 2.7M for OS/2	Character-based for SQL; Windows for Easy SQL		\$750-\$30,000, depending on hardware	\$300-\$30,000
Logica Corp. (617) 998-0911	Any	Ashton-Tate dBase III, C-RAM, Ultramax, Oracle Server	DB2, OS/2, Unix, Vines, R/230ACTOR	IBM PCs and compatibles, AT/XT 386 series, Compaq 3 series, TI 486, 8000 and 7000 series, VCB 33 series, Sun Sparcstation, IBM and OS/2 series	Any	Application, form, report	Assembly, Pascal, C, Cobol, Pascal	Any TCP/IP, TTY	640K	11M	Character-based, Microsoft Windows	\$999-\$30,000	\$100-\$30,000, depending on hardware and by hardware model, and per user
Vivamus, Inc. (310) 743-3661	Syftic System	SQL Server, Novell Netware SQL, Oracle Server	OS/2, OS/2	IBM PCs and compatibles	C	Application, form, report	Any*	LAV Manager, Novell Netware	640K	None required	Character-based	\$650 per server	No per-client charge
Workshop Systems, Inc. (617) 304-0900	QuickServer/SQL	Capita Software, Oracle Server	DB2, Unix	IBM PCs and compatibles	Shows with extended SQL	Report	Assembly, C	Scan 3+ Client, Ingres, LAV Manager, Lotus, Novell Netware, Banyan Vines	640K	2.0M	Character-based	\$795	No per-client charge

\*Product automatically translates other languages into SQL, therefore does not make calls directly to or from traditional programming languages.

The companies included in this chart responded to a recent survey conducted by Computerworld. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

# Cooperation can be perfectly NATURAL.

In the past, different computer systems were isolated – even antagonistic. Now, thanks to the powerful, flexible 4th Generation Technology known as NATURAL, organizations with mixed computing environments can get the maximum possible return on their investment in information systems. For example, NATURAL for Rdb/VSAM works flawlessly within Digital's COHESION software development and Network Application Support (NAS) environments. Letting developers write superior applications quickly and port those programs

– unchanged – to a variety of IBM and other environments. And removing environmental dependencies from the application code means applications can be ported into the future as well.

Applications delivered today span Rdb, RMS or ADABAS under VMS. As well as DB2, SQL/DS, IMS/DB, DL/I, VSAM or ADABAS on IBM platforms. NATURAL also supports interactive prototyping and fully integrated CASE. It's 4th Generation productivity and high performance that's available now! And provides a client/server

computing framework for the future.

So find out more. For all the facts, call 1-800-843-9534. (In Virginia, call 703-860-5050; in Canada, call 519-622-0889.) Learn how cooperation and portability can pay off for even the biggest rivals.

**Your success is how  
we measure ours.**

 **SOFTWARE AG**

© 1990, Software AG. NATURAL is a trademark of Software AG.  
The DIGITAL logo, COHESION, Rdb/VSAM, NAS and VMS are trademarks of Digital Equipment Corporation. IBM, DB2, IMS, VSAM, SQL/DS are trademarks of IBM Corporation.



# IN DEPTH

## Johnson Wax's people investment

*Continued from page 1*  
employees. In October, the program won the Assist Award from the Association for Computer Training and Support.

Finding and keeping qualified staff has become a major IS issue, and Johnson has chosen to invest in developing internal expertise rather than turning to consultants and outsourcing for "quick fixes," according to Dean LaGrange, senior manager of technical support, who helped design Proficore. The application gives the \$2.5 billion privately owned maker of such consumer products as Raid insect repellent and Pledge furniture polish a firm grip on the IS skills it houses.

Implemented in the fall of 1989, Proficore compares available expertise with the skills required for upcoming projects so IS can determine its educational needs. Proficore is serving as a model for other Johnson business areas and will be licensed to other companies, such as Xerox Corp.

Internally, three functional departments — the U.S. consumer products sales staff, a 1,200-person consumer products manufacturing plant and corporate research and development — are involved in development projects modeled on Proficore.

The Proficore project is one component of an all-out Johnson effort to "re-engineer our business processes," says Bill Vinck, senior IS director of policy and planning. Another is the company's recent implementation of its \$5 million Computer Integrated Customer Service System, which Johnson says has reduced customer order turnaround time from 14 days to approximately five.

Another part of the re-engineering process has involved decentralizing the IS support function by placing technicians in each business unit, says Tim Theriault, head of end-user computing services. In the R&D group, for example, corporate IS support time previously spent answering user ques-



Theriault, head of Johnson's end-user computing services, says a re-engineering of the IS support group included decentralization.

tions has dropped from 60% to 25%. "We're trying to go even lower in reducing calls to the corporate help desk," he says.

IS recognized that it needed to get a handle on its resources, particularly on the staffing side, when Johnson undertook converting thousands of business applications from a Honeywell, Inc. platform to an IBM mainframe in 1988. According to the IS staff, the shift coincided with the October 1988 arrival of forward-thinking CIO Burden from Firestone Tire & Rubber, Inc.

Today's technologically spiraling industry, the company realized, meant keeping staffs trained in emerging database, fourth-generation language and a myriad of other technologies that could make or break IS' ability to keep Johnson competitive. For ex-

ample, the company used Proficore to identify a Focus support expert quickly when the employee who handled that function in the end-user computing area left the firm.

Proficore will evolve, Burden says, because "we need to keep developing expertise to define systems that can exchange information effectively and rapidly with each other and with the corporate mainframe."

A primary goal of the firm is to reduce the number of major computing platforms, which now stands at seven. "It takes a lot of people to support all those platforms, and it is difficult to make integration seamless," explains Tom Heyerholm, senior IS manager of network services resource management.

Proficore has actually saved the company money. The company says it has so far decreased its annual professional development investment — \$440,000 in 1989 — by 20%. For example, instead of individuals signing up for outside IBM DB2 courses ad hoc at "\$1,000 a pop," the company used Proficore to identify 25 people needing training in that area and brought an instructor on-site for \$2,500, says Mike Berenowitz, IS education manager.

To design Proficore, the IS professional development group put together more than 100 IS job models that detailed the skill levels required for projects. "We probably hadn't rewritten our job descriptions in at least 10 years," says Lou Sasso, senior IS manager of resource development.

The job models set up a rating system for key IS skill areas such as business, personal, interpersonal and technical expertise. Interviews with staff provide data about an employee's existing skill level, and Proficore compares that data with the skill level required. Those employees and managers with access authority then determine the "percentage qualified" of an individual for a given project and identify training areas needed. \*

### At A Glance



<b>Sales</b>	\$2.5 billion
<b>Employees</b>	13,000 in 47 locations worldwide; 402 in information services
<b>Chief information officer</b>	Laurance Burden
<b>IS budget</b>	More than \$70 million
<b>Key systems</b>	IBM 3090 Model 300; 3090 Model 200; DEC VAX 6420s and Vaxclusters; IBM AS/400 (main computing platform overseas); Stratus Computer and Tandem Computers fault-tolerant systems for manufacturing applications
<b>Host operating systems</b>	IBM MVS (corporate systems); VM (marketing, scanner processing, demographic analysis); DEC VMS
<b>Personal computers</b>	2,000 IBM PCs (standardizing on Dell Computer Intel 80386-based systems); several hundred Apple Macintoshes
<b>Database software</b>	IBM DB2; Software AG Adabas (phasing out)
<b>Development software</b>	Texas Instruments Information Engineering Facility
<b>Networks</b>	British Telecom Tynnet with IBM Systems Network Architecture protocols; Fiber Ethernet supporting Macintoshes; IBM PC-based Token-Ring and Decnet; TAT-8 translucent fiber trial under way

# When it comes networking solutions,

Recognizing the full potential of networking is one thing—actually realizing it is another. To truly fulfill that potential, every component of your network needs to turn in a great performance. That's why IBM offers a complete range of leading-edge LAN products in the desktop networking field—giving you the broadest range of solutions available to continually advance your system's possibilities.

## MANAGERS THAT TURN IN A GREAT PERFORMANCE.

At the heart of IBM networking are the members of the Personal System/2® family that act as high-performance LAN servers. The PS/2® Model 95 XP 486, IBM's sophisticated new 486™ computer, was especially designed to optimize network performance. The Model 95 features an Intel 33 MHz 486 processor or a 25 MHz 486 processor that's easily upgraded to 33 MHz, which quickens the pace of your LAN's operations. For your network's storage, not only are the Model 95's SCSI hard files lightning-quick, but the overall capacity is truly impressive—up to 1.6 gigabytes internally, and up to 896GB or more with IBM PS/2 External Enclosures. IBM also offers highly efficient, lower-cost server alternatives with the PS/2 Models 80 386 and 65 SX. All of IBM's PS/2 LAN servers feature the Micro Channel™ architecture, with its 32-bit data path and bus-mastering capabilities. The Micro Channel busmaster adapters allow you to expand your network's capabilities by adding multiple processors—like adding "computers" to your computer. It all amounts to highly reliable and powerful managers that inspire the same kind of performance from the rest of your network.

## AN EFFICIENT WAY TO BRIDGE YOUR DATA.

Whatever your needs may be, IBM has PS/2s that can serve as excellent client stations. And if you want to keep a tight rein

on your network's information, IBM offers the PS/2 Model 55 LS, a medialess LAN station version of the best-selling Model 55 SX. A cost-efficient alternative to models with storage drives, the Model 55 LS provides a wide array of effective management controls, including enhanced data security, consistency in software levels, central software maintenance and central file backup. Not only is the Model 55 LS easy to hook up (it comes standard with a Token-Ring Network or Ethernet adapter), but should you need to modify your system, it's easy to upgrade with diskette and file storage devices.

## A NEW BREED OF SOFTWARE.

Software that hits the ground running—that's our powerful new OS/2® V. 1.3, a high-performance, low-cost software package that supports both DOS and OS/2 clients on either a Token-Ring or Ethernet Network. Both the new OS/2 Extended Edition V. 1.3 and LAN Server V. 1.3 create an environment that delivers improved



# to advanced IBM leads the way.

performance, less memory requirements, fewer DASD requirements and support for Adobe Type Manager™ fonts. And with support for I28 DOS requesters, LAN Server V.1.3 can provide significant cost benefits for DOS network users. Compatibilities between IBM DOS LAN requester and the current version of Windows® 3.0 (LAN Manager 2.0 enhanced) have also been added, capping off the many ways IBM gives you greater flexibility in the LAN environment.

## PRINTING THAT'S THE BEST IN THE FIELD.

For a great finish to any project, IBM offers a full range of printers for client stations, as well as the speedy, large-capacity IBM LaserPrinter, an efficient printing station with immensely attractive LAN benefits. With a high-duty cycle and fewer parts for fewer breakdowns, it offers extremely reliable printing while still boasting a 10-ppm printing speed. The optional paper bins allow for more efficient collation, so there's no need to visit and rearrange the printing station prior to the particular job. You can also easily and inexpensively upgrade to Adobe PostScript®. It all adds up to a range of complete, reliable printing solutions that can handle the kind of workload that any network, large or small, can generate.

## STEP UP THE PACE WITH TOKEN-RING NETWORK.

To optimize the link between your LAN server and client stations, you need a hardware connection that gives you access to departmental and company data, as well as communication with your co-workers—in other words, you need access to a winner's circle: the IBM Token-Ring Network, the winner four years running of the *PC World Magazine World Class Award*. It's a reliable and flexible networking solution, one of the only connections with a data transfer rate of up to 16MB per second.



You can also diagnose, isolate and correct problems in one section of your LAN without affecting the rest of your network. A system you can build on, IBM Token-Ring Network provides a reliable connection that's as strong as your need to keep in constant touch with the people and information around you.

## COMMUNICATE WITH HORSES OF A DIFFERENT COLOR.

Of course, IBM provides you with several ways not only to connect your PS/2 LAN to a multitude of mid-range and mainframe systems, but also to communicate with non-IBM systems as well. To conduct transactions

such as hotel reservations, car rental and credit card authorization, an IBM communications adapter such as the IBM ARTIC Portmaster Adapter/A busmaster card, with the proper communications software, can link your PS/2 with other companies' computers. With an Ethernet adapter, you can also connect to most Ethernet LANs. The integrated communications options of IBM OS/2 Extended Edition software can also allow your PS/2 to send mail, transfer files and access applications on other systems concurrently. So it's easy to benefit from the strengths of an IBM network while still having access to the rest of the computing world.

With the many components that constitute a Local Area Network, it's plain to see why a LAN is only as strong as its weakest link. That's why the IBM total LAN solution—LAN servers, workstations, networking software, printing stations and Token-Ring Network—is simply without peer: because there are no weak links. To find out how IBM can keep your network ahead of the pack, contact your IBM Authorized Remarketer or IBM marketing representative. For a remarketer near you, call 1 800 272-3438.



How're you  
going to do it?  
PS/2 it!

**IBM**

IBM, Personal System/2, PS/2 and OS/2 are registered trademarks and Micro Channel is a trademark of International Business Machines Corporation. 486, 386 and 286 are trademarks of Intel Corporation. Windows is a registered trademark of Microsoft Corporation. Adobe PostScript is a registered trademark, and Adobe Type Manager is a trademark of Adobe Systems, Inc. © 1989 IBM Corp.

## Receiving the gift of technology

*Firm's strategy targets PC compatibles, feature-rich LANs*

BY JOANIE M. WEKLER

S. C. Johnson & Son, Inc. is undergoing a whole re-engineering of its business processes (see story page 1). Company officials say the effort will result in a waterfall of new technologies for the company's information systems staff.

For end users, the company, commonly known as Johnson Wax, standardized last month on Intel Corp. 80386-based personal computers from Dell Computer Corp. and the Microsoft Corp. Windows 3.0 interface. Tim Theriault, who heads up Johnson's end-user computing function, says that with the 150 new PC procurements the company plans to make next year, it will save \$300,000 with the Dell platform.

"We can get three Dells for the price of two IBMs, so we're doing more with the same amount of money," he explains.

### Unix, SAA in the lead

The firm is currently evaluating running Unix as a desktop operating system. "In the coming years, IBM's Systems Application Architecture and Unix will be the two compelling architectures we will con-

cern ourselves with," adds Laurence Burden, Johnson's chief information officer.

The company also intends to turbocharge its local-area networking strategy by replacing limited-capability IBM Personal Computer networks with a more feature-rich LAN platform, according to Theriault.

He notes that Johnson is pilot testing Novell, Inc.'s Netware and Microsoft's OS/2 LAN Manager. However, he says, the company would be open — if it were possible — to running Novell applications over a Banyan Systems, Inc. Virtual Networking Software backbone.

Johnson would like to capitalize on a combination of Banyan's StreetTalk global naming service and the myriad business applications available for Novell LANs.

The new LAN strategy is meant to replace Token-Ring IBM PC networks in the administrative area, because the existing networks "have no security, and the speed and network level are inferior," Theriault says. He also notes that each IBM PC network server can accommodate only 10 users.

"In the 1990s," Theriault explains,

"the network will be the most critical component for facilitating future applications."

For example, he says, running IBM's Professional Office System (Prof's) on an IBM 3090 mainframe "is expensive and not as efficient; there are issues with response time and transparent access."

Theriault adds, however, that "we have to be sensitive to the impact LANs will have on Prof's — it's the most impor-

tant application we have."

Another new technology lurking in the Johnson corridors is the 100MB bit/sec. Fiber Distributed Data Interface (FDDI) LAN. FDDI will eventually replace the existing 10MB bit/sec. fiber Ethernet backbone connecting Johnson departments in two major buildings at the Racine, Wis., headquarters.

Johnson also says FDDI is on the drawing board for its overseas operations. ■



CEO Burden: SAA, Unix the compelling architectures

## A household name

Following is a summary of Johnson Wax's leading products:

### U.S. Consumer Products Division

- Home care: Future, Brite and Klear floor waxes, Pledge and Favor furniture polishes, Glory bone cleaner, Shout, Glade room deodorizer.
- Insect control: Raid and Off insect repellents.
- Personal care: Agree and Halsea shampoos and conditioners, Soft Sense skin lotion, Aweeno bath products, Edge shaving gel, Fisher-Price bath products for children.

### Worldwide Innochem Division

Commercial and industrial cleaners, floor finishes, disinfectants, soaps and insect and odor control products, specialty chemicals for graphic arts, industrial coatings and adhesives industries

### Worldwide Service Businesses Division

Commercial and industrial cleaning, disinfecting and pest-control services

Principal U.S. subsidiaries: Johnson Venture Capital, Inc.; Micro-Gen Equipment Corp. (pest control equipment); Prism (restaurant and hotel sanitation services)

# It's the fastest But it will never cat

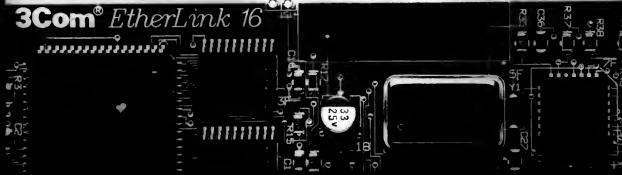
You can go fast. You can go safe. Just not together. Until EtherLink® 16. This 16-bit Ethernet network adapter is up to 90 percent faster than its major competitors. Yet it runs with a lifetime warranty.

You can use it with your IBM PC, XT, AT, PS/2 Model 25 or 30 and compatibles, as well as EISA computers. And it's ready to run on NetWare, LAN Manager and 3Com® 3+Open.

What's more, EtherLink 16 is speedy to install,

\*An independent laboratory, LantQuest Group, did the testing, and you can get a copy of their glowing report on speed by calling us at 1-800-NET-3Com. You can also request the data on reliability, and learn why that of two million 3Com adapters in use, 99.5 percent have never needed repair.

## 3Com® EtherLink 16



## Johnson business units to get financial control

BY KIM S. NASH

**T**he new year is expected to ring in a new financial system at Johnson Wax, and it comes not a moment too soon.

Although executives at the \$2.5 billion, 104-year-old privately held firm appear unfazed at the recession talk that now ricochets around Wall Street, it will redesign its accounting system in 1991 to better service its diverse customer markets. By the summer of 1992, Johnson's Consumer Products, Worldwide Innochem and Worldwide Service divisions will no longer share one financial setup. "It isn't that the current system is terrible, but it's not strategic now that our headquarters has become a virtual holding company for all of our other businesses," explains Mark Eckhardt, information systems director of financial services.

The goal of the Financial Systems Architecture Project (FSAP) is to give each unit control of its own accounting with complete financial environments at the business unit level. Now, each of the three units uploads monthly sales figures, operations expenses and other data to a single Software AG of North America, Inc. Adabas database running on an IBM 3090

mainframe in Johnson's Racine, Wis., data center.

While numbers are crunching, managers in the business units have no on-line access to their own data, Eckhardt says.

After 18 months of meetings with users, planning sessions with Chief Financial Officer Larry Switzer and Chief Information Officer Laurence Burden, Eckhardt says he expects to push FSAP ahead in 1991. FSAP will give each business a separate VSAM-based database that can run on either of Johnson's two 3090s, with user access via personal computers already in place.

### We're keeping up, but...

Eckhardt denies that Johnson's financial department lags behind others in implementing a decentralized modus operandi, but he points to several areas that could be more strategically configured.

For example, some of the company's statistical analysis activities are just partially automated. When a manager at one of the 47 subsidiaries under the Consumer Products umbrella downloads data from Adabas, he often must manually enter those statistics into his spreadsheet.

Also, Johnson tracks plenty of telling business statistics, such as product-by-

product sales comparisons and reports on regional research and development efforts. However, this data is not getting to the right people at the right time.

When FSAP is complete, Eckhardt says, "our managers will be looking at more information that is more accurate, on a timely basis."

Software is the real missing piece in the revamp. FSAP mandates only off-the-shelf packages because they are virtually bug-free and probably cheaper than those developed in-house, Eckhardt says.

After reviewing 30 financial packages, he whittled his list down to three vendors: Dun & Bradstreet Software, American Software, Inc. and Global Information Systems Technology, Inc. A final decision is due in early 1991. Johnson will customize the packages very little because, Eckhardt says, "we would rather change the way we do business than drastically modify any technology we may buy."

In some cases, new policy will improve work flow more than new software might, he notes. Specifically, Eckhardt wants to exploit Johnson's existing international Ethernet network by piggybacking financial data, such as treasury and loan information, atop regular monthly accounting numbers sent from international offices.

The subsidiaries currently send this data to headquarters on paper — data that Racine personnel must cross-check manually, a tedious, time-consuming job, he explains. Transmitting this information electronically would eliminate many errors and allow each unit to officially close its monthly books sooner.



Johnson's Eckhardt says current financial system is no longer strategic.

Because final executive committee approval for FSAP deployment is not due until the end of this month or early next, the company will not project what bottom-line benefit or productivity gains it expects from FSAP, Eckhardt says, however, that the project's goal of simpler, more flexible finances that would allow more managers more access to data can only promote better decision-making. ■

Nash is a Computerworld researcher, features.

# board available. ch up to its warranty.

because there are no jumpers to slow you down.

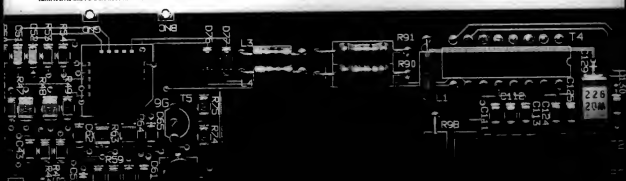
But why not see for yourself?

Just call 1-800-NET-3Com Dept. D5056 for the name of your nearest 3Com reseller.

## 3Com

We network more types of systems  
to more types of systems.

©1988 3Com Corporation, 5400 Bayfront Plaza, Santa Clara, CA 95052. Telephone (408) 746-5000. 3Com, 3+ Open, EtherLink and the 3Com logo are trademarks of 3Com Corporation. IBM, XT, AT and PS/2 are trademarks of International Business Machines Corporation. NetWare is a registered trademark of Novell, Inc. Lanquest is a trademark of Lanquest Group.



## Database kills paperwork dead

*Regi electronically tracks firm's product regulatory progress*

BY KIM S. NASH

What do Africa's tsetse fly, Australia's bush fly and the American house fly all have in common? Besides being pesky at the family barbecue, these bugs are all vulnerable to a spray product: Raid.

Insect control products are Johnson Wax's most profitable business, but the product line itself is vulnerable. Because marketability of insecticides is strapped to environmental restrictions, "green" movements can be cause for concern at Johnson.

It is no coincidence that Johnson went live last month with a new \$50,000 object-oriented database that tracks products as they weave through the environmental registration procedure. The Regi database (short for registration) will cut the work load of Johnson's regulatory affairs department by as much as 50%, says Annette Oleson-Wiles, information systems manager of knowledge engineering.

"Our registrations people are dying under paper," Oleson-Wiles says. Much of that paper is a by-product of the registration process that the U.S. Environ-

mental Protection Agency (EPA) mandates for every new consumer product. State and local laws increase the paper deluge because they are often stricter and more complex than EPA rules.

Built on an expert system shell from Aion Corp., Regi automates the legal checks involved in manufacturing and selling chemical products. Regi tracks Johnson's goods through Byzantine state and federal registration processes, while allowing different departments to retrieve custom information.

The marketing department, for example, can ask for information about which states have approved a product and which have not. The state regulations group, meanwhile, can use Regi to prepare applications based on preprogrammed or

customized criteria.

Before Regi, Johnson stored EPA and state data in different repositories on different computers. People could not easily find out where a product was in the cycle at any given time, Oleson-Wiles says. Now, all such data is housed at one easily accessible location.

Although Regi currently runs on IBM's SQL/DS from an IBM 3090 mainframe, Oleson-Wiles anticipates migrating the system to DB2 on Johnson's MVS mainframe within six months.

The EPA and local agencies can deny a new product for any of several clerical reasons, including a discrepancy in wording between the final and initial applications, Oleson-Wiles explains. The EPA requires that product labels, for example,

# Computerworld

**Reprints from *Computerworld* provide a valuable marketing/sales tool for your company!**

Editorial articles are available as reprints and can be ordered in various quantities, and customized to include your company logo and sales offices. Whether you wish to have reprints of an article written specifically about your company or a subject of general interest, these reprints\* can be a great resource for use in:

- Promotional/P.R. materials
- Internal meetings
- Company seminars

\* Produced in minimum quantities of 500 for black-and-white and two color reprints; 1,000 for four-color reprints.

For complete information on ordering reprints contact:

Sharon Bryant  
Reprints Department  
Computerworld  
375 Cochituate Road  
Framingham, MA 01701-9171  
Tel. 508-879-0700



**COMPUTERWORLD**

The newspaper for information systems management



Johnson's Oleson-Wiles: "Our registrations people are dying under paper"

convey the same idea that was originally registered. There is a subtle but important difference, she says, between claiming that a product "kills bugs faster" and saying that it "kills bugs twice as fast."

By cross-checking such data, Regi can warn appropriate departments of any problems early in the process. Previously, if a mistake escaped the eyes of Johnson's registration personnel, it was not discovered until the product application came back rejected.

### No competition

A registration delay "can put us out of the competitive picture," says Roger Grothaus, who supervises state and EPA product registration as Johnson's vice president of scientific support and government affairs.

Regi will eliminate clerical errors and increase Johnson's first-try registration acceptance rate to between 90% and 100% within a year, Grothaus predicts. "That means we get our products on store shelves that much faster," he says.

Johnson's business units abroad have already requested copies of Regi, says Ted Derser, director of corporate business systems, who oversees Oleson-Wiles' knowledge engineering group. Because of the database's generic framework, going on-line in foreign locales will take just 10% of Regi's original five-month development time, Oleson-Wiles estimates.

"The guts of the system are transparent. Local offices would only have to plug in local regulations," she says. However, she doesn't expect international rollout until 1992, "when it has been put to the test of all-out daily use." ■



**Announcing  
the end of  
the phone bill.**

# Introd The AT&T Intelli

## It tells you more about your

***AT&T Billing Information Manager***  
***The intelligent way to bring order to your billing.***

Give your business the benefit of the Intelligent Phone Bill from AT&T Billing Information Manager. Here are just a few examples of what it can do for you.

☐ **Executive Summary:**

You can learn a lot from your phone bill when AT&T Executive Summary Reports break out your billing. This can help you

pinpoint busy days. Identify unusually long or short calls. As well as discover patterns and trends hidden in your call traffic. And the best thing is that all this information is standard with your monthly bill on most of our services.

☐ **Detail Manager:**

Maybe you need a more detailed report. With AT&T Detail Manager, you can get a customized billing report any way you want it. Zip code, area code, frequency of

usage, length of call, city, state, even cost category. You name it, we do it. Once your billing is in order, information becomes clearer and you can better manage your business.

☐ **Execu-bill:**

Organize your billing by calling card. With AT&T Execu-bill reports, we can break out your calling card usage by location, region or department. In fact, these reports can be designed to match

ucing

# gent Phone Bill.

business than what you owe.

your corporate structure. So you can control calling card use, identify high cost centers and track expenses more easily.

## ☐ Call Manager:

AT&T Call Manager can organize your billing with the push of a button. Just enter a code and the call is automatically sorted as you dial. It makes life easier for anyone who has to assign costs to clients and projects, account for business and

personal calls or keep track of departmental expenses.

## ☐ Summary Billing:

Now when it comes to billing, we can break it out and send it out in a way that matches your company's structure. With AT&T Summary Billing, we can provide service information to your branch offices and send the bill to your main office. Or we can do just the opposite. You decide who gets what information, and

in the end, the bill is easier to pay.

So whether you need a lot of detail or just a little, we have an option that's just right for you. The AT&T Intelligent Phone Bill. It'll be the one bill you'll find a pleasure to read.

*AT&T Billing Information Manager  
Another AT&T advantage.*

For more information, contact your AT&T Account Executive or call 1 800 247-1212, Ext. H2.



**AT&T**

The right choice.



## SCHEDULE THE ULTIMATE GOAL

Goal Systems' new Goal System™ lets you schedule your workday around the clock. You can schedule your workday around the clock. You can schedule your workday around the clock. You can schedule your workday around the clock.

Goal Systems' new Goal System™ lets you schedule your workday around the clock. You can schedule your workday around the clock. You can schedule your workday around the clock. You can schedule your workday around the clock.

Goal Systems' new Goal System™ lets you schedule your workday around the clock. You can schedule your workday around the clock. You can schedule your workday around the clock. You can schedule your workday around the clock.

Goal Systems' new Goal System™ lets you schedule your workday around the clock. You can schedule your workday around the clock. You can schedule your workday around the clock. You can schedule your workday around the clock.



**Goal Systems**

# COMPUTER INDUSTRY

## NATIONAL BRIEFS

### Second quarter, second place

Shareholders resoundingly approved the \$6.2 billion deal last week that will merge Centel Corp. and GTE Corp. into the second largest U.S.-based mobile/cellular telecommunications company, trailing only McCaw Cellular Communications, Inc. The firms anticipate a second-quarter 1991 closing.

### Spreading the wealth

IBM has targeted nine U.S. communities where its employees are concentrated as recipients of a \$3.5 million fund that will go to finance 21 child-care and elder-care centers, the company announced last week. The investment will be drawn from the \$25 million IBM Dependent Care Initiatives Program announced last year.

### In new hands

International telecommunications holding company BellSouth Corp. is out of the leasing business — at least in the U.S. The Atlanta firm's U.S.-based equipment leasing portfolio, formerly held by its Data-serv subsidiary, is now in two new sets of hands: The data processing and check-sorting equipment leasing business was sold to Meridian Leasing Corp., while Savana Business Credit Corp. bought the point-of-sale equipment leasing business.

### Declaring independence

On-line transaction processing systems vendor Stratus Computer, Inc. planted a not-for-sale sign in its Marlboro, Mass. front yard earlier this month. The firm said its new shareholder rights plan, aimed at staving off hostile takeovers, was not adopted in response to any known acquisition attempt. The plan's adoption puts Stratus in yet another growth business: Some 1,300 U.S.-based firms, including many in the computer industry, have now enacted so-called "poison pill" provisions.

### Shrinking deficit

At least, so says the American Electronics Association (AEA). Based on trade results through the third quarter of 1990, the AEA projected that the U.S. electronics trade deficit with the rest of the world will shrink 80%, from 1989's \$9.6 billion figure to \$1.9 billion at the end of the current year.

## Picturitel prospers in tough times

BY NELL MARGOLIS  
OF STAFF

PEABODY, Mass. — After six years of hard work and crossed fingers, Picturitel Corp., one of the nation's two publicly held firms devoted solely to producing videoconferencing equipment, is an overnight sensation.

A combination of technological foresight and managerial insight, according to analysts, has landed the 1984 brainchild of two MIT students — a firm that was forced to go public to raise its start-up fund when venture capitalists wrote it off as too risky — squarely in the right place at the right time:

- Technological advances have enabled the firm to offer conference-quality video at affordable prices (see story below).
- Long-distance telephone carriers have plugged into the teleconferencing services market through alliances with equipment providers — AT&T's mar-

keting partnership with Picturitel, for example — blessing and driving the videoconferencing systems market in the process.

• Industry standards continue to increase domestic and international connectivity, allowing for expanded service at economy of scale-enabled price breaks.

• The current recession and the threat of an imminent oil crisis are adding urgency to the already felt need for an alternative to business travel.

• Picturitel and San Jose, Calif.-based Compression Labs, Inc. are the only major independent contenders in a market that analysts see as sustaining annual growth in the 35% ballpark for at least the next few years, to an estimated \$600 million by 1995.

Three years ago, said John Mulcahy, vice president of information systems at Dun & Bradstreet Software, McCormack & Dodge, the Natick, Mass.-based firm, then served, looked at Picturitel "and found the sys-

## Up and Coming: Picturitel Corp.



"Our biggest danger would be losing our focus. What we've got to do is use lots of third-party alliances, focus on the core technology and drive."

- ▷ Location: Peabody, Mass.
- ▷ Incorporated: 1984
- ▷ President: Norman E. Gout
- ▷ Employees: approx. 185
- ▷ Product line: software-upgradable videoconferencing systems

tems too slow and too expensive." M&D gave it a pass. One year later, Picturitel broke through the price and quality barrier.

Last spring, in the wake of M&D's merger with Atlanta-based Management Science America, Inc., the firm — faced with dual headquarters, execu-

tives commuting between Georgia and Massachusetts and a critical need to make instant colleagues out of potentially warring work forces — signed on for two full videoconferencing systems, each supporting external document cameras.

"This doesn't just let us conduct our business more efficiently or economically," Mulcahy said. "It also lets us accomplish things that would simply be impossible otherwise."

"This is a real watershed time for Picturitel," said Chief Executive Officer Norman E. Gout, a veteran computer industry entrepreneur who founded, grew and sold his own firm before taking over the helm at Picturitel in the fall of 1985.

Gout said industry history has taught him that when a firm has one foot firmly on the skyrocket trail, the other is likely to be on a banana peel. With one factor after another breaking his company's way, Gout is treading very carefully on both technological and corporate grounds.

Continued on page 77

## HVQ method lets Picturitel realize a dream

Six years ago, MIT students Brian Himmus and Jeff Bernstein took a look down the decade and saw folks communicating face to face over the phone. Their vision was simple, elegant and even technologically feasible. It just wasn't time yet. High-quality, lifelike video images could be transmitted only at prohibitive prices via satellite; affordable transmission meant degraded reception.

Like novelist Ray Kinsella's baseball film, Himmus and Bernstein took the message: "If you build it, they will come." The two carved out their own field of dreams: Picturitel. And "they" came: the technology, the financiers, the customers and, as of early autumn, the profits. What they came for was a videoconferencing system that works over dial-up digital or private networks for basically telephone call prices.

Picturitel attacked the resolution/expense conundrum by developing an image compression technique called Hierarchical Vec-

tor Quantization (HVQ). Video compression is the ability to reduce the amount of information needed to store or transmit a video image. This addresses the dollar side of the equation, since reduced transmission requirements mean lower costs. HVQ tackles the resolution issue as well: By coding images according to resolution level, it renders compression-driven distortions less visible. Picturitel's 1988 introduction of the C-3000 Video Codec (short for coder-decoder) — which compresses signals, decodes them and lets them be carried by ordinary telephone lines — " catapulted the company from obscurity to contender status," said Tucker, Anthony analyst Herb Maher.

The firm commands some 75% of the low-bandwidth videoconferencing market, analysts said. Customers can buy full systems, all operative on a phone line, starting at \$34,000; alternatively, it will also sell you a codec and let you tailor your own system.

NELL MARGOLIS

## Report hits Navy on use of IBM gear

BY GARY H. ANTHES  
OF STAFF

WASHINGTON, D.C. — A report detailing the results of a two-year congressional investigation blasted the U.S. Navy for its computer procurement practices but found IBM generally blameless in a tangled web of charges of fraud, abuse and anti-competitive bias.

"Through a combination of agency malfeasance and the dominance of [IBM], the failed and open system competition by

Congress has been torpedoed in Navy [automatic data processing] procurement," the report said.

The House Government Operations Committee said the Navy has shown a systematic and illegal bias in favor of IBM in its procurement of mainframe computers. It also said the Navy has acted unethically and illegally in accepting gratuities and free training from IBM, some of whose employees coached Navy personnel in writing procurement specifications when those

personnel were seeking bids for IBM or compatible equipment.

"The Navy cooperated fully with the committee during the course of the hearings and will implement any actions deemed appropriate to ensure that all ADP procurement is conducted fairly and in accordance with all laws and regulations," a Navy spokesman said.

"IBM appears, for the most part, not to be responsible for the bizarre Navy ADP acquisition system but merely its willing beneficiary," the House com-

mittee concluded.

A spokesman for IBM said the industry had turned up no evidence that the firm had acted unlawfully or unethically. "We consider the matter closed," he said.

The report had little to say that had not already been made public, but it did make several new recommendations. Among them was that the U.S. General Services Administration, which oversees federal computer buys, should undertake an immediate review of the training offered to the government by computer firms and contractors to determine whether it is worth the attendance by federal employees.

# Introducing The First Word Processor Designed By An Army, A Telephone Company, Genetic Engineering, Atomic Research And, Of Course, The IRS.

It's true. A whole army of Fortune 1000 companies and government agencies are designing future versions of MultiMate. Including an actual army. And a think tank. A band-aid maker. Oil companies. And five major insurance firms.

The 140 members of the MultiMate Customer Advisory Board want cross-platform compatibility. So we're developing versions of MultiMate for UNIX and other platforms. These compatible programs will reduce training and support costs, while providing consistent, easy-to-use word processing across your entire computing environment.

The information professionals on the Board are also



MultiMate

familiar with other popular word processing programs. They know which features are productive, which aren't, and what's missing. By listening to their advice, we give you a word processing product that's second to none.

Accomplishing this is a continuing process, but we've already added advanced features to MultiMate version 40 that include the industry's

leading grammar checker, built-in electronic mail, a drawing function for creating forms, graphics importation and editing, plus the most extensive file conversion capability in the business.

We're also committed to regular, timely upgrades to keep pace with today's emerging technology.

For more information on the future of MultiMate, call 1-800-437-4329, Ext. 1909. Or upgrade to MultiMate version 40 now for only \$75 by calling 1-800-2ASHTON.

If you want your word processor to be all that it can be, join the army of companies that have made MultiMate a major industry standard.



**Ashton-Tate®**

Trademark/Copies: MultiMate, Ashton-Tate, Logo/Ashton-Tate Corp. Other product names used herein are for identification purposes only and may be trademarks of their respective companies.  
© 1990 Ashton-Tate Corporation. All Rights Reserved. CPT03-GSA Schedule # G100N00051026

## Patent rights getting much tougher to protect

BY MAURAJ. HARRINGTON  
OF STAFF

SAN JOSE, Calif. — Patent rights have become increasingly difficult to protect in the computer industry, with more complex issues ahead in the 1990s, said Semiconductor Industry Association Director of International Trade and Government Affairs Daryl Hatano at the American Bar Association's recent annual fall meeting. Although semiconductor companies can spend millions in litigation fees to protect their intellectual property rights, the investment makes for firms that are less inhibited when it comes to inventing new products — which means better products for end users, Hatano said.

Speaking specifically about the semiconductor industry, Hatano said that although increasing competition from Japan — and, soon, from Europe — has made it more difficult for U.S.-based companies to protect their patents, more firms than ever are turning to patents, copyrights and other means of protecting their intellectual property.

The semiconductor industry's annual revenue is currently around \$50 billion and is expected to grow to \$75 billion by 1993, Hatano said. Semiconductor companies account for almost 20% of the

electronics industry, which today is a larger manufacturing employer in the U.S. than the auto, steel and aerospace industries combined, he said.

Thus, Hatano added, with about 10% of its annual revenue spent in research and development in this tighter, more competitive and more global market, the semiconductor industry has a compelling need to protect its intellectual property. In addition, Hatano said, semiconductor firms today face some of the following issues:

- Control of patents and copyrights —

which are more common modes of protection for software — after products are shipped outside the U.S. This is a big problem in Thailand and South Korea, where there are no specific laws in place to protect intellectual property, according to Lee Green, an attorney at the Washington, D.C.-based law firm Baker & McKenzie.

• Niche-specific questions, such as whether software applications that help a semiconductor manufacturer maximize space on a computer chip nullify that manufacturer's patent.



The question has been posed, Hatano said, because if the computer is doing all of the work mapping out the design of the chip, the likelihood that it will pick the same design for more than one computer-sized design user is very high, thus posing patent protection rights questions.

• Reverse engineering. Part of the reverse engineering technique involves photolithographic technology, which is the method of peeling off the chip layer by layer and photographing it to see how it was put together. While the method is legal, the right to reuse the knowledge gained from this technology is questioned.

Should this method be used in research and development? The issue is still unresolved, Hatano said.

## Ask watchers still in dark

BOSTON — A corporate road show billed as the event at which Ask Computer Systems, Inc. would answer the burning question of exactly how it plans to play newly acquired Ingres Corp. left analysts largely underwhelmed earlier this month.

Ask founder and Chief Executive Officer Sandra Kurtzig and Ingres Products Division Vice President Marilyn Bohl, a former IBM developer credited with the development of DB2 and the only Ingres executive to remain at Ask after the acquisition, were generous with overarching goals but came up short on implementation strategy details.

Armed with Ingres, Kurtzig said, \$4-million Ask will move beyond its role as a business and manufacturing applications provider to become a leader in software development targeted at client/server computing. To achieve its goal, she said, the merged company will leverage two strengths: a talent for partnership and the ability to derive more than half of the bottom line from international operations.

"We don't know anything now that we didn't know before, and some of the omissions are disconcerting," said Charlotte Walker, an analyst at Labe, Simpson & Co. Still among the missing, Walker noted, are specifics regarding Ask's plans for reconciling Ingres' and Ask's disparate accounting methods; the role that \$60-million equity investors Electronic Data Systems Corp. and Hewlett-Packard Co. will play in Ask's assault on the client/server market; and how Ask intends to overcome the marketing deficit that dogged Ingres as a database and tool vendor and that, in Kurtzig's words, "had sushi and marketed it as raw fish."

NELL MARGOLIS

# EIS

## If You're Thinking About It ...

# XEROX

## **Ventura Publisher introduces the Gold Series. It simply does more, any way you look at it.**

And now there are several new ways to look at it. Because the desktop publisher that does more for you now does it all in the three leading PC environments.

The Gold Series introduces new Ventura Publisher® editions for DOS/GEM, Windows 3.0, and OS/2 Presentation Manager. That means new ease of use and learning as well as compatibility with hundreds more software applications. All three new editions can use documents from Ventura Publisher 1.1 and 2.0.

### ***It does even more than before.***

The Gold Series gives you much more than a choice of environments. At no extra cost, each edition includes our Professional

Extension and Network Server. So you also get such advanced DTP features as interactive table creation and scientific equation editing, cross referencing, and vertical justification.

And you get networking. So several users can edit and proofread simultaneously as well as share stylesheets and network resources. On Novell, IBM, 3COM, and other Windows- and OS/2 Presentation Manager-compatible networks.

Whether you're designing a newsletter or publishing a directory, you'll do it faster and more effectively with Ventura Publisher. Unique features give you more flexible and precise type control, and automate many

steps other programs make you repeat over and over. Ventura Publisher is the one DTP program that can handle all your publishing and design projects.

If you want to do more in desktop publishing, doesn't it make sense to use the program that does the most? Call today for more information about the new Ventura Publisher Gold Series. (800) 822-8221 in USA; (800) 228-8579 in Canada. For training information, call (800) 445-5554. Ventura Software Inc., a Xerox company.

**Ventura Publisher  
Gold Series**  
*It simply does more.*





## Picturatel

CONTINUED FROM PAGE 73

"The biggest thing we have to avoid right now is losing focus," he said. "What we've got to do is use lots of third parties, focus on the core technology, and drive, drive, drive." Gaut is also resolved to resist the temptation to ride the technology and let the corporate side slide.

"As soon as a company grows beyond what I call the shouting limit—that 50-60 people size where when you shout, everyone can still hear you—corporate processes have to come into the picture," Gaut said. Corporate infrastructure becomes more critical, he added, when the firm reaches "that second plateau: the

one around the \$15 million to \$20 million mark where technology is no longer dominant, and you realize... you've actually got to sell that son of a gun."

Gaut places Picturatel at the third plateau: "the stage at which so many companies stall out because they're the captives of their founders."

These traps will not snag Picturatel if Gaut can help it. When the company moved to the second plateau, Gaut replaced its chief financial officer, "who was very talented but inexperienced," with current CFO Joan Nevins, who came on-board armed with big-company experience. A similar switch brought in a new head of sales and marketing, Rob Mitro. Gaut sees two signs that he made the right moves: the success with which both

new appointees are meeting and the fact that both of their predecessors remained with the firm. "Nine times out of 10," he noted, "people will walk when someone is brought in over them." A third endorsement is coming from analysts, several of whom said that Picturatel's management depth bodes as well for the firm's future as does its flashy and timely technology.

"So many companies stumble at that \$100 million mark," said Herbert R. Maher, an analyst at Tucker, Anthony in Boston. "Picturatel is only at \$36 million, and Norm Gaut's already thinking about how to avoid the pitfalls; that strikes me as very encouraging."

Analysts also find it encouraging that the Picturatel management team is keenly aware that no free or easy ride lies

ahead. Last quarter, the firm lowered one red flag when it posted its first profit on quarterly revenue, up 110% year to year. However, increasing attention focused on the videoconferencing market is bound to mean escalated competition—particularly from Japan. A slowdown in the development of its next generation of product or the inability to market them at an attractive price could prove anything from damaging to devastating.

Today, the firm that could not scare up a venture investor is 65% owned by a group of them that includes Kleiner, Perkins and Aczel Partners, an ownership structure that provides not only funding, but also a hedge against unwanted acquisition. Japanese partner Kyocera also has a 6% stake in the firm.

## INTERNATIONAL BRIEFS

### Venture capital city

According to a recent report out of Taipei, the Taiwan government plans to boost its fledgling venture capital market with an infusion of at least \$59 million during the next several months. The state-run Bank of Communications plans to use the venture capital fund as seed money to help start a handful of new venture capital funds, many of which will be targeted at the country's information industry.

### European software sales rising

North American software firms' third-quarter 1990 European sales jumped to \$229 million, 63% over 1989 figures for the comparable period, the Software Publishers Association (SPA) announced earlier this month. This compares with a second-quarter 48% growth rate, which varied from country to country, according to the SPA report. The German software industry is not faring very well internationally, according to a recent study by Paris-based corporate consultants Pierre Audoin Conseil. A preference for remaining small and independent at a time when their counterparts in other countries are focusing on mergers and acquisitions made German suppliers a no-show in Audoin's listing of the top 30 internationally strongest software firms, Audoin said. The study showed that U.S. suppliers are dominating the worldwide software and services sector. Led by Electronic Data Systems Corp., with \$2.48 billion in worldwide revenue, U.S. firms held the top six spots. France's Cap Gemini Societ ranked seventh; Germany's largest vendor, Datav, entered the ranks at a distant No. 36.

### Slow boat to Hong Kong

IBM workstation users in Hong Kong are complaining about a string of late deliveries of the RISC System/6000 since its release last February. "It's an open secret that IBM cannot meet the demand for the RS/6000 in Asia," one Hong Kong source said. In an official statement to *Computerworld Hong Kong*, IBM acknowledged "some shipment delays, due to a shortage of certain elements of the system" but noted that the situation is now "very much back to normal, and that the delays had no impact on sales."

# EIS II

## Think Twice.

It's estimated that more than half of today's Executive Information Systems fail.\* So if you're thinking about installing a traditional EIS, think twice.

EIS II is the new generation of Executive Information Systems. It's more than just an electronic "slide show." It's true analysis and issue management. For executives, their staffs, and managers throughout your organization.

Only Express/EIS® from Information Resources gives you the power of EIS II today. On mainframe, LAN or PC. With full data integrity, end-user flexibility and worldwide support.

If you're thinking about EIS, think EIS II.

### Express/EIS Delivers:

- Ease of use for executives, staff and management
- Smooth integration of tracking, analysis and issue response
- Intelligent exception reporting and drill-down
- Dynamic links to corporate data
- Low maintenance costs

For a free EIS II Information Kit, call 617-890-8717 (416-221-2100 in Canada).



## information resources

\*David W. Oelberg, co-author of "Executive Support Systems: The Emergence of Top Management Computer Use."

©1990 Express/EIS is a registered trademark of Information Resources, Inc.



# Delivery Guar

## **That's how confident we are of AT&T MAIL X.400 interoperability.**

Just because someone has a mailbox, it doesn't mean your mail can be delivered. But AT&T MAIL GATEWAY400 means you're not limited anymore to just intracompany and intravendor messaging. Now you can send electronic mail virtually anywhere, nationally or internationally Guaranteed\*.

Why are we able to give you a guarantee? Because

of our Acceptance Test Lab, which tests your compatibility with other systems, makes adjustments to bring you into full interoperability, and certifies that it works.

AT&T interconnects with major domestic and foreign service providers and has been a leader in the deployment of X.400 standards since their adoption in 1987. X.400 also extends your reach with Electronic Data Interchange, which facilitates paperless transactions of standardized business documents.

AT&T provides you with the highest quality support.



# anteed.

At start up, AT&T introduces each customer to a fully dedicated Customer Implementation Group of experts. And when your GATEWAY400 system is up and running, AT&T monitors the network 24 hours a day.

AT&T MAIL GATEWAY400. It can unlock the whole world of electronic messaging for you.

*Interoperability: Another AT&T advantage.*

For more information, call your AT&T Account Executive or 1 800 321-6747, Ext. 400.



**AT&T**

The right choice.

# WHY SHOULD YOU ATTEND YET ANOTHER CONFERENCE?

Simply because this is the first Image Management Technology conference designed specifically for the educational needs of prospective and existing end users.

You can expect some of the most significant product announcements of 1991, including announcements by:

**WANG**

**digital**

**FileNet**

Presentations by some of the most advanced users of image management technology, including:



**General  
American**



And a chance to "roll up your sleeves" and address many of the same issues that you will confront when you elect to employ this technology.

**Don't miss your chance to attend**

**IMAGE MANAGEMENT TECHNOLOGY: BEYOND THE OBVIOUS**

Phoenix, Arizona  
at The Point at Tapatio Cliffs  
January 16-18, 1991

**To register, or for more information, call 1-800-525-5456 X-456**

Sponsored by IDC/Avante Technologies, Inc., a Joint Venture  
5 Speen Street, Framingham, MA 01701



YES, I want to receive my own copy of **COMPUTERWORLD** each week. I accept your offer of \$36.95\* per year — a savings of 62% off the single copy price.

First Name \_\_\_\_\_ MI \_\_\_\_\_ Last Name \_\_\_\_\_  
 Title \_\_\_\_\_ Company \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
 Address shown: ☐ Home ☐ Business ☐ New ☐ Renewal Basic Rate: \$48 per year  
 \*U.S. Only. Canada \$68.97. Central/South America \$130. Europe \$185. All other countries \$295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

**COMPUTERWORLD**



YES, I want to receive my own copy of **COMPUTERWORLD** each week. I accept your offer of \$36.95\* per year — a savings of 62% off the single copy price.

First Name \_\_\_\_\_ MI \_\_\_\_\_ Last Name \_\_\_\_\_  
 Title \_\_\_\_\_ Company \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
 Address shown: ☐ Home ☐ Business ☐ New ☐ Renewal Basic Rate: \$48 per year  
 \*U.S. Only. Canada \$68.97. Central/South America \$130. Europe \$185. All other countries \$295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

**COMPUTERWORLD**

1. **BUSINESS/INDUSTRY** (Circle one)  
 10. Manufacturer (other than computer)  
 11. Financial/Investment/Bank  
 12. Medical/Life/Insurance  
 13. Professional/Trade  
 14. Business Service (except CP)  
 15. Government - State/Federal/Local  
 16. Communications Systems/Public Utilities  
 17. Transportation  
 18. Manufacturing - Process/Production/High-Tech  
 19. Systems or Peripherals  
 20. System Integrators, MFI's, Computer Service  
 21. Business Software Planning & Consulting Services  
 22. Computer/Peripherals Dealer/Other Reseller  
 23. User - Other \_\_\_\_\_ (Please specify)

2. **TITLE/FUNCTION** (Circle one)  
**ASSOCIATE MANAGEMENT**  
 10. Chief Executive Officer/Vice President/Asst. VP  
 11. VP/Asst. VP  
 12. VP/Asst. VP  
 13. VP/Asst. VP  
 14. VP/Asst. VP  
 15. VP/Asst. VP  
 16. VP/Asst. VP  
 17. VP/Asst. VP  
 18. VP/Asst. VP  
 19. VP/Asst. VP  
**OTHER COMPANY MANAGEMENT**  
 10. President, Owner/Partner/General Mgr.  
 11. Vice President, Asst. VP  
 12. Treasurer, Controller, Financial Officer  
 13. Engineering, Scientific, R&D, Tech. Mgr.  
 14. Sales & Mktg. Management  
**OTHER PROFESSIONALS**  
 10. Medical, Legal, Accounting Mgr.  
 11. Educator, Administrator, Librarian, Business  
 12. Other \_\_\_\_\_ (Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)  
 Types of equipment with which you are personally involved as a user, vendor or consultant:  
 A. Mainframe/Supersystem  
 B. Microcomputer/Small Business Computers  
 C. Microcomputer/Personal  
 D. Communications Systems  
 E. Communications Peripherals  
 F. Local Area Networks  
 G. No Computer Involvement

E4051B-2

1. **BUSINESS/INDUSTRY** (Circle one)  
 10. Manufacturer (other than computer)  
 11. Financial/Investment/Bank  
 12. Medical/Life/Insurance  
 13. Professional/Trade  
 14. Business Service (except CP)  
 15. Government - State/Federal/Local  
 16. Communications Systems/Public Utilities  
 17. Transportation  
 18. Manufacturing - Process/Production/High-Tech  
 19. Systems or Peripherals  
 20. System Integrators, MFI's, Computer Service  
 21. Business Software Planning & Consulting Services  
 22. Computer/Peripherals Dealer/Other Reseller  
 23. User - Other \_\_\_\_\_ (Please specify)

2. **TITLE/FUNCTION** (Circle one)  
**ASSOCIATE MANAGEMENT**  
 10. Chief Executive Officer/Vice President/Asst. VP  
 11. VP/Asst. VP  
 12. VP/Asst. VP  
 13. VP/Asst. VP  
 14. VP/Asst. VP  
 15. VP/Asst. VP  
 16. VP/Asst. VP  
 17. VP/Asst. VP  
 18. VP/Asst. VP  
 19. VP/Asst. VP  
**OTHER COMPANY MANAGEMENT**  
 10. President, Owner/Partner/General Mgr.  
 11. Vice President, Asst. VP  
 12. Treasurer, Controller, Financial Officer  
 13. Engineering, Scientific, R&D, Tech. Mgr.  
 14. Sales & Mktg. Management  
**OTHER PROFESSIONALS**  
 10. Medical, Legal, Accounting Mgr.  
 11. Educator, Administrator, Librarian, Business  
 12. Other \_\_\_\_\_ (Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)  
 Types of equipment with which you are personally involved as a user, vendor or consultant:  
 A. Mainframe/Supersystem  
 B. Microcomputer/Small Business Computers  
 C. Microcomputer/Personal  
 D. Communications Systems  
 E. Communications Peripherals  
 F. Local Area Networks  
 G. No Computer Involvement

E4051B-2



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**

FIRST CLASS PERMIT NO 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

**COMPUTERWORLD**

P.O. Box 2044  
Marion, Ohio 43306-2144



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**

FIRST CLASS PERMIT NO 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

**COMPUTERWORLD**

P.O. Box 2044  
Marion, Ohio 43306-2144





# COMPUTER CAREERS

## CASE IEW/IEF

### EAST COAST WEST COAST SOUTH WEST

CHE is a national full service design, engineering and construction organization, with 27 offices throughout the U.S. We are a comprehensive source of expert technical knowledge and skills covering solutions to the most complex information management and business application problems.

Our CASE and ICASE teams on both Coasts are engaged in significant development efforts for a variety of clients including:

Service, Manufacturing and Financial "GIANTS" within their industries.

If you possess ICASE or CASE experience and seek either long term employment or short term assignments utilizing your skills, we should talk.

CHE provides full benefits including company paid relocation. Temporary housing available for short term assignments.



COMPUTER HORIZONS CORP.

#### EAST COAST

84, Riverside  
40 Old Southfield Avenue  
Southfield, MI 48034-1400

In New Jersey call (201) 481-1400  
Outside of NJ, call toll free:  
1-800-371-2421 or Fax (201) 481-7908

#### SOUTHWEST

Kathy Hickey  
2000 East Camelback Road, Suite 300  
Phoenix, Arizona 85016

Call Kathy (602) 956-7900  
or Fax (602) 956-7908

An Equal Opportunity Employer M/F  
"The Solution Experts"

#### WEST COAST

Richard Rosenblum  
225 West Broadway  
Suite 475  
Glendale, CA 91204

Call Richard (818) 500-1083  
or Fax (818) 502-1879

#### SYSTEMS ANALYST

Specialize in the design and analysis of the most advanced computer systems. The computer systems analyst is a key position in the computer industry. This position involves the analysis of business requirements and the design of computer systems that meet these requirements. The computer systems analyst is responsible for the design and development of computer systems that meet the needs of the organization. The computer systems analyst is responsible for the design and development of computer systems that meet the needs of the organization. The computer systems analyst is responsible for the design and development of computer systems that meet the needs of the organization.

Senior Systems Analyst, 40 hrs/wk, \$45,000/yr. The Computer Systems Analyst is responsible for the design and development of computer systems that meet the needs of the organization. The Computer Systems Analyst is responsible for the design and development of computer systems that meet the needs of the organization. The Computer Systems Analyst is responsible for the design and development of computer systems that meet the needs of the organization. The Computer Systems Analyst is responsible for the design and development of computer systems that meet the needs of the organization.

## Satisfied with Your Current Position?

### Just Imagine Where We Can

### Take You From Here

Goal Systems International Inc. (NASDAQ: GOAIA), a leader in the design, development and marketing of software products, has an immediate need for product developers in Los Angeles and Houston.

At Goal, our product developers are responsible for various phases of product development from state-of-the-art MVS Automated Systems Operations products. This includes product design, programming, product testing, support and future enhancements.

The ideal candidate will possess the following:

- 5 years plus experience as an IBM/370 Assembler language programmer;
- 5 years plus of solid MVS experience;
- Strong MVS internals knowledge;
- Strong knowledge of NETVIEW, VTAM, ISPF, CICS and/or IMS;
- Operating Systems programming and Product Development experience. Experience in Automated Operations desirable.

This position offers an excellent compensation and benefits package. For immediate consideration, please direct your inquiries along with salary history to: Human Resources, Goal Systems International Inc., 7965 N. High Street, Columbus, Ohio 43235



EOE/M/F/H/V  
Principals need only apply

AUTOMATED OPERATIONS

MVS SOFTWARE DEVELOPERS

## Why WTW?

Because There's The Best Reason. Taylor, Wells, & Associates, Inc. is a leading software consulting firm in the challenging careers across the country for top computer professionals with application development experience.

DEC VAX, SMARTSTAR Job or Oracle  
Send resume or call (617) 271-7271  
We're Hiring! Taylor, Wells & Associates, Inc. 2000 21st Street, Suite 200, Boston, MA 02116-1000  
1-800-853-2992



W & A  
Taylor, Wells & Associates, Inc.

When you compare costs the people reached. Computerworld is the best newspaper for qualified computer professionals.

Place your ads today!

Call toll-free 800-343-6474

Or in Mass (508) 879-0700

The Chamberlain Group, Inc. is the world's largest package design and manufacturing company with facilities in Mexico, currently has the following opportunity:

#### SYSTEMS ANALYST

Position requires 3-5 years experience in a manufacturing environment (preferably IBM) utilizing structured analysis/design methodologies and application/implementation of MRP II, J-1 and TQM systems/programs. Experience with relational databases, BCP, control and personal computers is also necessary. Candidates must have a Bachelor's degree in Business or Information Systems and excellent interpersonal communication skills.

Surrounded by mountains and lakes, lagoons and surrounding areas offer congestion-free neighborhoods, good schools and a healthy environment in which to raise kids, plus the distinctive beauty and scenic lifestyle of the great Southwest. It's a great place to live.

The Chamberlain Group offers a competitive salary and an excellent benefits package. Please send your resume to The Chamberlain Group, Inc., Mr. Chris Laydard, One West Chamberlain Group, P.O. Box 500, Tempe, AZ 85278. EEO M/F/V.

### CHAMBERLAIN

A Unit of Duchesne Industries, Inc.  
Quality of Life.  
Quality of Work.



#### MOONLIGHTING OPPORTUNITY SOFTWARE COURSE DEVELOPER

Are you a software engineer with skills in software development and programming? Do you have experience in software development and programming? Do you have experience in software development and programming? Do you have experience in software development and programming?

Send resume to: Moonlighting Opportunity, P.O. Box 1000, San Jose, CA 95128. EEO M/F/V.

#### SOFTWARE ENGINEER

For company that provides software for transportation and other industries. The Software Engineer is responsible for the design and development of software systems that meet the needs of the organization. The Software Engineer is responsible for the design and development of software systems that meet the needs of the organization. The Software Engineer is responsible for the design and development of software systems that meet the needs of the organization.

## UNISYS

PROGRAMMERS  
C/C++ \$45K  
COBOL \$45K  
FORTRAN \$45K  
JAVASCRIPT \$45K  
MAPPER \$45K  
PASCAL \$45K  
PERL \$45K  
PYTHON \$45K  
RUBY \$45K  
SQL \$45K  
VBA \$45K  
VBSCRIPT \$45K  
XSLT \$45K  
XML \$45K  
YAML \$45K  
ZSH \$45K

#### COMPUTER STAFFING

Call (800) 343-6474

#### TRANSLATIONS ENGLISH TO JAPANESE

Starting opportunity. Part or full-time translation assistance needed for converting computer manuals to Japanese. Long term project. Contract work. Proficient editor/proofreader in English and Japanese. Excellent pay for top quality work. Send qualifications and samples (include only the English) to: Mr. Richard L. P.O. Box 31, Cambridge, MA 02136.

## MIS DIRECTORS

If you need good people, we've got them. Computerworld reaches more than 612,000 computer professionals every week. That's more qualified computer pros than any newspaper can deliver. And you can select either a regional edition or national edition of Computerworld's Computer Careers section for your ad.

For more information, or to place your ad regionally or nationally, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700).

Computerworld Weekly, Regional, National. And It Works.









## SOFTWARE PROFESSIONALS

Computer People Unlimited is one of Wisconsin's greatest business success stories. In just 7 years, we have grown to be the largest locally owned software services firm in the state, employing over 200 acclaimed consultants - and making a name for ourselves in the national business press.

How do we do it? We employ the best software talent in the business - and expose them to the latest technologies going. Join us in Milwaukee, Madison or Appleton - and start the new year in good company. We currently have opportunities for professionals with the following experience:

- DEC VAX
- UNIX
- IDMS - ADS/O
- C
- TELON
- C++
- Sun

Additional opportunities are available for professionals with any combination of the following: LANSA, PL/I, PC Applications, AS/400 or System/38, FOCUS Programming, Tandem, Pathway, TALL, SCOPE, DB2, ORACLE, IMS, LAN Administration. Scientific software opportunities also exist for professionals with experience in any combination of the following: Objective C, Smalltalk, Realtime, VAX/VMS and X-Windows.

CPU offers attractive salaries and excellent company benefits. To apply, call Bill Rudd or Julie Endlich at 414-225-4000 or 1-800-527-8462. Or send your resume in confidence to: Computer People Unlimited, Dept. CW-1217, 744 N. 4th Street, Milwaukee, WI 53203. An equal opportunity employer, M/F/V/H.



THE  
NEW YEAR  
IN GOOD  
COMPANY

**CPU**

COMPUTER PEOPLE UNLIMITED INC.

## Engineer II

The Center for Computer Aided Design seeks an experienced individual to develop a program in CAD tools for structural members and systems design. Responsibilities include: developing, testing, and validating software for structural analysis and design. The successful candidate will be responsible for the development of research software and the implementation of research software. The successful candidate will be responsible for the development of research software and the implementation of research software. The successful candidate will be responsible for the development of research software and the implementation of research software.

**Structural Engineer II**  
The Center for Computer Aided Design seeks an experienced individual to develop a program in CAD tools for structural members and systems design. Responsibilities include: developing, testing, and validating software for structural analysis and design. The successful candidate will be responsible for the development of research software and the implementation of research software. The successful candidate will be responsible for the development of research software and the implementation of research software.

## Engineering Systems Engineer

Executes software development life cycle for computer systems which includes designing, coding, testing and validating software programs that solve engineering/manufacturing related problems using computer aided technologies, mathematics, geometric modeling and computer graphics. Performs work which involves solving engineering system problems by applying an understanding of engineering/manufacturing processes, standards and task controls to devise solutions through analysis, design and implementation of computer software as well as integration of software with current and third-party vendor software and porting of the integration work to computer workstations in the design, engineering, tooling and manufacturing operations.

Education required: Bachelor of Science in Computer Science, Mechanical or Electrical Engineering. Academic course work must include 3 credit hours in each of the following: Computer aided design (CAD), data base management systems, data and file structures, computer operating systems, and distributed systems. Experience required: One year as a Designer or Manufacturing Engineer in an automotive environment.

The minimum working hours are 40 hours per week, with a starting salary of \$40,200 per year. This is an employer-paid.

Please send resume in confidence to: Michigan Employment Security Commission, 730 Woodward Avenue, Room 415, Detroit, Michigan 48202. Reference No. 89990.

An Equal Opportunity Employer  
M/F/V/H

## PURDUE UNIVERSITY

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

Computer Technology

XEROX

## Systems Sales and Sales Support Professionals

We're Making History. Again.



It was easy at first. Computer technology was just taking off. But as the Information Age continues to evolve, so does the technology. The real challenge is putting it together. To be more productive. And, we believe that is the document that unifies a work group, an idea, a contribution. So we've created our highly sophisticated DocuTech product line to produce better documents. And coupled with our printing systems products, we're primed to revolutionize offices the world over.

If you've got a polished systems sales or systems sales support professional and quality for either of the following positions, join the team that captured the Malcolm Baldrige National Quality Award. You'll find that your skills in our environment can lead to a very rewarding future.

## Systems Sales Specialists

As a member of our Systems Sales force, you will assume primary sales responsibility for our systems business, selling DocuTech or printing systems products. And as an added benefit, you'll receive world-renowned Xerox training.

To qualify, you'll need:

- 3-5 years' successful sales experience in a systems environment
- Proven consultative sales experience
- Knowledge of networking, publishing and/or MIS environments
- BSBA degree or equivalent
- Excellent presentation and demonstration skills
- Major account selling experience preferred.

## Systems Analysts

Acting as the driver of pre-sales customer needs assessment and post-sales application development efforts, you will be providing support to our systems sales professionals.

To qualify, you'll need:

- An undergraduate degree or equivalent with a concentration or major in Computer Science
- 3-5 years' data communications and applications analysis and design with concentration in network and/or production publishing environments or experience in a centralized MIS environment with IBM operating systems experience preferred.
- High level of interpersonal, oral and written communication skills
- Experience with a hardware/software vendor in a systems marketing support function.

Xerox offers a highly competitive starting salary and comprehensive benefits. But best of all, you'll find that when you put your skills together with Xerox technology and training, there's a lot more you can accomplish. For immediate consideration, please send your resume with salary history, indicating position of interest, to: Employment Manager, Xerox Corporation, Dept. CW, 690 Canton Street 02060, Weymouth, MA 02090. Or fax your resume to (617) 339-2718. Xerox is an equal opportunity employer.

**XEROX**  
The Document Company

## SOFTWARE ENGINEER

Software Engineer  
The software engineer will be responsible for the development and testing of software programs. The successful candidate will be responsible for the development and testing of software programs. The successful candidate will be responsible for the development and testing of software programs.

Software Engineer  
The software engineer will be responsible for the development and testing of software programs. The successful candidate will be responsible for the development and testing of software programs. The successful candidate will be responsible for the development and testing of software programs.

Software Engineer  
The software engineer will be responsible for the development and testing of software programs. The successful candidate will be responsible for the development and testing of software programs. The successful candidate will be responsible for the development and testing of software programs.

Software Engineer  
The software engineer will be responsible for the development and testing of software programs. The successful candidate will be responsible for the development and testing of software programs. The successful candidate will be responsible for the development and testing of software programs.

Software Engineer  
The software engineer will be responsible for the development and testing of software programs. The successful candidate will be responsible for the development and testing of software programs. The successful candidate will be responsible for the development and testing of software programs.

Software Engineer  
The software engineer will be responsible for the development and testing of software programs. The successful candidate will be responsible for the development and testing of software programs. The successful candidate will be responsible for the development and testing of software programs.

Software Engineer  
The software engineer will be responsible for the development and testing of software programs. The successful candidate will be responsible for the development and testing of software programs. The successful candidate will be responsible for the development and testing of software programs.

## DMM

Celebrating Twenty Years of Providing  
Total Business Solutions to Major  
Corporations Throughout the Southeast

## PROMOTE YOURSELF!

Dynamic employment/consulting firm has new requirements for both permanent positions and contract assignments for Programmer to Systems Analysts. State-of-the-art environments with salaries from \$35,000 to \$55,000, and rates from \$25.00 per hour dependent upon experience. Software includes:

VAX NATURAL IBM IMS DB/DC  
FORTRAN/FMS IDMS/ADS-O  
INQUIRE DB2 CSP  
ORACLE DB2 SQL  
RDB

Call or send resume to:  
Permanent Placement: Dana Blalock  
Contract Assignments: Kelly Birmingham

**DMM Data Masters®**

P.O. Box 16486, Dept. CW  
Greensboro, NC 27415-6486  
(919) 272-1481 FAX 1-800-325-3387  
MAIL 1-800-325-3387

SINCE 1971 NATIONALLY AFFILIATED DOE  
• Add about our all-new 1981 Salary Survey •



**"...Based on number of leads per dollar invested, I always win with Computerworld Response Cards."**

— Paul D. Boone  
President  
Stile Software Company

Paul D. Boone, President of Stile Software Company, distributes OUTBOUND, an amazing new file transfer system developed by Firesign Computer Company of San Francisco. His start-up company, based in Orford, New Hampshire, is relying on Computerworld Direct Response Cards to help expand its customer base throughout the United States and Canada.

"OUTBOUND" is unique in that it transfers files directly between PCs and a mainframe in one easy step, without having to depend on or even involve the end users.

Since it's initiated and controlled by the mainframe, files can be transferred at any time — day or night. In fact, as long as the PC is turned on, can communicate with the host, and is running OUTBOUND under MS-DOS, OUTBOUND can go right to work. It's so productive that it even lets the end users run other applications on their PCs while the host is transferring data back and forth. The central site can transport files to and from the users without having the end users do anything. It just can't get any easier than that. "Now it's my job to show potential buyers what this 'ultimate user-friendly' system can do for them. Specifically, I'm targeting applications development managers and info center managers in larger companies with distributed computing environments. My goal is to get the OUTBOUND message out to lots of people quickly, easily, and economically. So I chose Computerworld Response Cards.

"And it was the right choice. I was extremely impressed with the number of inquiries I received very quickly — calls actually started coming in the very first day. My advertisement in the August Computerworld Response Card deck alone generated over 300 good leads. In following up, I've already installed a number of OUTBOUND systems under our 30-day "No Hassle" Free Trial Program. And that's good news for me, since typically 80% of all OUTBOUND trials result in sales.

"Converting leads into sales — economically — is the backbone of my business. Here, based on cost per reader and number of leads per dollar invested, I always win with Computerworld Response Cards. And to keep on winning next year, I plan to double my frequency schedule in Computerworld Response Card decks."

Computerworld Direct Response Cards give you a cost-effective way to reach Computerworld's powerful buying audience of over 134,000 computer professionals. Every month. Call Norma Tamburrino, National Account Manager, Computerworld Direct Response Cards, at (201) 587-0090, or (201) 587-0297 to reserve your space today.



**COMPUTERWORLD  
DIRECT RESPONSE CARDS**

# MARKETPLACE

## Patent laws protect creative development

*Editor's note: Legal eye is a monthly column exploring legal issues and their impact on information systems.*

BY RAYMOND T. NIMMER  
SPECIAL TO CIO

Copyright laws directing the software development industry for the past decade are taking a bow to a more powerful maestro: patent laws. And IS managers who oversee all new product development cannot afford to turn a deaf ear to the changes because the stakes are too high.

First, an IS manager should understand the differences between copyright and patent laws. Copyright prevents anyone from copying someone else's creative work, but patent law goes further. Patents make both copying and independent development equally prohibited.

For example, if one of your developers designs a software tool that optimizes how data is moved around in a particular environment, and your company patents that approach, another developer cannot use the same

process without your company's permission — even if the second developer never saw the original invention.

Unlike copyright laws, patent laws protect the technology, not the code. They cover how the software directs the computer to perform. As a result, even if the computer uses entirely different code, a program that handles data in essentially the same way that a patented program handles data infringes on the patent.

Merely refurbishing or fine-tuning the code or design may not bring the new program out from within the scope of the valid patent.

To obtain a patent, a company must file a claim for a specific invention. However, even if an invention requires substantial work and has great commercial value, no patent will be issued unless the invention reflects sufficient originality. That is, the invention should not be one that is obvious to another person skilled in the same technology.

During the patent application

stage, a company or inventor must describe how best to perform the invented procedure. Then, if a patent is issued, this description is made public in the patent files for anyone to reference.

Patent disclosure is a major benefit to individual companies and the software development industry. Disclosure laws give the inventing company a reason to reveal technology that it might otherwise conceal from others.

On the flip side, however, patent holders gain rights to exclude all others from using the technology they develop. The economic incentives created by the law can be strong and focused on development of a high order.

A major problem with the rise of software patents is that the patent examiners lack a comprehensive base of

prior software innovations against which to compare a new claim. How can examiners determine whether a patent claim is obvious if they don't have a strong base of software innovation patents to draw from? Unfortunately, software has not been developed against a background of patent protections, and many of the most innovative software systems have been de-

signed, implemented and modified without any organized record.

This problem may soon be alleviated by the current overall shift to stronger software patent laws. At some point in the future, these rules are going to dictate or structure how software development occurs. This will be a fundamental change in the way software is created. Rather than an open field, it will become much more structured.

Specific differences between what we have now and a stronger patent rights system include the following:

- Companies will have to support the costs of the patent application system, requiring legal services to pursue the application and financing to bring it to a conclusion. The costs vary but are always an added factor requiring a greater investment than for copyright. Also, obtaining a patent takes a long time during which it will not be clear whether the application will succeed.

- Patent rules protect technology and methods. This protection runs counter to the status quo, in which new developments historically come from additive work and development and adaptation, rather than from breakthrough "grand insights."

- Patent rights do not permit an independent development defense. Once granted, the patent holder owns rights to preclude

anyone from using the patented process. This may reduce independent, diversified development of software. It represents a change that contradicts what many believe to be the strength

**U**NLIKE copyright laws, patent laws protect the technology, not the code.

of the industry: its diversity and its flexibility.

Patent protections encourage companies with the resources to collect numerous patents and enter cross-licensing agreements with other patent holders. Measured against existing industry practice, this creates another change. It moves away from laws that favor small companies and entrepreneurs to ones that favor resource-strong companies.

Patent laws are taking hold of the industry and are here to stay — for a while, at least. IS managers who know the laws and their ramifications will be that much more ahead of the game. Unfortunately, in the case of patent law, ignorance is not bliss.

Nimmer is author of *The Law of Computer Technology* and is a Leonard Childs Professor of Law at the University of Houston.



### Buy/Sell/Lease

#### The BoCoEx index on used computers

Closing prices report for the week ending December 7, 1990

	Closing price	Recent high	Recent low
IBM PC Model 176	\$375	\$450	\$390
XT Model 086	\$500	\$550	\$450
XT Model 089	\$550	\$625	\$400
AT Model 099	\$650	\$975	\$500
AT Model 239	\$875	\$1,025	\$750
AT Model 339	\$925	\$1,100	\$900
PS/2 Model 30-286	\$1,100	\$1,300	\$1,025
PS/2 Model 60	\$1,500	\$1,800	\$1,400
PS/2 Model 70P	\$3,425	\$3,450	\$3,175
Compaq Portable II	\$900	\$1,050	\$875
Portable 286	\$1,100	\$1,450	\$1,000
SLT 286	\$2,500	\$2,625	\$2,000
Portable 386	\$2,800	\$2,800	\$2,500
LTE 286	\$2,000	\$2,100	\$1,850
Dashgore 286	\$1,200	\$1,200	\$975
Dashgore 386/30	\$2,900	\$3,100	\$3,400
Apple Macintosh Plus	\$750	\$975	\$700
SE	\$1,150	\$1,450	\$1,100
II	\$2,700	\$2,900	\$2,600
IIFX	\$6,500	\$6,900	\$6,400

INFORMATION PROVIDED BY THE BOSTON COMPUTER EXCHANGE CORP.

#### IBM SPECIALISTS

SELL & LEASE BUY  
S 11 S 36 S 38 S 40 S 48  
(314) 311-3742

IBM PC, XT, AT, PS/2, 286, 386, 486  
IBM compatible hardware & software  
IBM service & support

800-251-2670

IBM logo

COMPUTER MARKETING

PO BOX 17 • 610 BELLEVUE, VT • OLD BRIDGE, NJ 07081

#### VAX RENTALS

BY 3800  
BY 3800/3800  
VAX 3800 SERIES  
VAX 3800 SERIES

Systems & Peripherals  
Fast Turnaround • Complete Products  
Upgrade Add-On Flexibility

BROOKVALE ASSOCIATES

1000 E. 10th St.  
EAST CLEVELAND, OH 44115  
(216) 323-3722

#### COMPUTER ROOM EQUIPMENT

##### LIBERT

Computer Room Air Conditioners  
3 Btu 22 Ton Units

Mobile Pseudo Chillers  
3 Btu 12 Ton Units

Power Filter/Conditioners  
30 Btu 228 KVA

PILLER  
40 & 75 KVA Standbys

LIBERT, EXIDE, EMERSON  
EPE & IPM

15.75 - 500 KVA UPS Systems

RAISED ACCESS FLOORING

Thousands of square feet in stock,  
wood and steel.

All Items Listed are recommended with warranty

DP SUPPORT  
P.O. Box 100  
Piquette, MI 48670

248-432-4951  
248-432-1286 Fax

Go Shopping In...  
Computerworld's  
CLASSIFIED MARKETPLACE

Call for all the details  
(800) 243-8474  
In MI, (248) 432-4951





**COST-EFFECTIVE  
COMPUTING SERVICES  
for TODAY and....  
TOMORROW**

**COMDISCO COMPUTING  
SERVICES CORP.**

Provides you with:

**REMOTE COMPUTING  
COMPUTER OUTSOURCING  
FACILITY MANAGEMENT**

Features:

- IBM® CPUs and Peripherals
- Systems Software:  
MVS/XA, TSO/E, ISPF/PDF,  
CICS, VM/XA, VM/SP, HPO, CMS
- Application Software:  
Database Management  
Application Development  
4/Gls Graphics  
Statistical Analysis
- Multiple Communications  
Methods
- Technical Support
- Automated Tape Handling
- ULTRA-Secure Data Center
- Advanced Laser Printing
- Pricing to fit your needs

Call: Robert Marino  
201-896-3011

**COMDISCO**

COMDISCO COMPUTING  
SERVICES CORP.  
400 UNION PARKWAY, CARLISLE, N.J. 07003

**Quality Outsourcing**

- IBM Mainframe/Peripherals
- Full Technical Support
- 24 hour Help Desk w/ 800#
- Database Specialists
- Consulting Services
- Network Specialists
- Capacity Planning
- Automated Operations

**Resources Available Include:**

MVS/XA, VM/XA, CMS, CICS, DB2/QMF, TSO/E,  
ISPF/PDF, SAS, Libraries, IBM in PANVEL,  
EASTREVE, Telnet/Tymnet, TOP SECRET



Call: (201) 216-3216

INFORMED TECHNOLOGY ALLIANCE CORPORATION

**QUALITY  
COMPUTING  
SERVICES**

- PROCESSING & SYSTEMS OPERATIONS  
OUTSOURCING  
FACILITIES MANAGEMENT  
REMOTE COMPUTING / TIME-SHARE  
SYSTEMS PLANNING & CONSULTING  
STRATEGIC SYSTEMS PLANNING  
NEEDS ANALYSIS / FEASIBILITY  
QUALITY ASSURANCE PROGRAMS  
PROJECT MANAGEMENT  
PROJECT LEAD / CONSULTANT SUPPORT  
SYSTEMS DEVELOPMENT  
SYSTEM / DATA CONVERSIONS

For more information contact Susan Smith at:  
CND 934-2527 or (800) 694-9247

Ask about our

specialized services



**REMOTE COMPUTING OUTSOURCING**

- MVS/XA • VM/SP • ISPF/PDF
- CICS • DB2 • SAS • DB2
- TSO/E • JCL • REXX • BASIC

- Mainframe Software Maintenance
- Installation • Configuration • Performance
- Programming • Testing • Debugging
- System Management • Backup/Recovery

For more information contact Susan Smith at:  
CND 934-2527 or (800) 694-9247

Ask about our special services

Call: (201) 216-3216

INFORMED TECHNOLOGY ALLIANCE CORPORATION

**OUTSOURCING AND  
REMOTE COMPUTING**

- IBM MVS/XA Environment
- CICS, DB2, SAS, JCL, REXX, BASIC, PL/I, COBOL
- Professional Support Staff
- Experienced Management Team
- Simplified Pricing
- 24 Hours a Day - 7 Days a Week
- AADIS
- Full Supporting Services
- Media Conversion
- Laser & Impact Print Facility
- Accounting
- Programming
- Technical Support
- 24 Hours a Day - 7 Days a Week

**May & Spoh, Inc.**

1801 Oak Park Drive, Suite 4, 90119-9713  
(800) 729-1501  
For More Information Contact: Terry Hansen

**ON-LINE WITH  
COMPOSURE**

- Multiple centers
- RACF, CICS, IMS
- Volume & serial discounts
- Full technical support
- Disaster recovery services
- MVS/XA, VM, DOS
- SAS, DB2
- Worldwide access
- Laser printing

**COMPOSURE**

(919) 469-3325

**ICOTECH**



- MVS/XA TSO/ISPF/ISPF/PDF, CICS, VM/XA, VM/SP, HPO, CMS
- VTAM FILE-AID, INTEREST, SAS, SAVES
- DB2, SHARE, ACPI, ADCC

- 24 hour availability
- International access
- Superior technical support staff
- Uninterrupted Power Supply
- Certified on-site visits
- Disaster recovery
- Impeccable service

Call Now - Solve Your Computing Woes

**TODAY & TOMORROW**

(201) 695-3400

**Business Opportunities**

**COMPUTERWORLD**

**CLASSIFIED  
MARKETPLACE**

Examines the issues while computer professionals examine your message. Call for all the details.

**(800) 343-6474**  
(In MA, 508/879-0700)

**Peripherals/Supplies**

**9-Track Tape  
For Your  
IBM  
PC/XT/AT/PS-2™**



Read 1800 or 6250 bpi  
9-track tapes from a 9-track  
micro or mainframe in EBCDIC  
or ASCII as mirror image or  
by individual files.  
Use the 2000 PC for  
disk backup, data inter-  
change or archival storage.  
PCCT-1195-B is replacement of IBM

**22** Print to Value  
DSD DATA CORPORATION  
8800 Dorsey Road  
Jensen, MD 20794-9995  
(800) 732-6265  
FAX (301) 468-0771

**CLASSIFIED  
MARKETPLACE**

Where  
Computer  
Professionals  
Shop

**(800) 343-6474**  
(In MA, 508/879-0700)

**COMPUTERWORLD**

**Classified  
Marketplace**

**gives you buyers  
with extensive  
purchase influence.**

In fact, a full 96% are involved in purchase decision making for their organizations. They determine needs, evaluate technologies, identify solutions, and select products and vendors for the entire range of information systems, as well as related products and services.

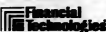
So if you're selling computer products and services, advertise in the newspaper that delivers buyers with volume purchasing influence. Advertise in Computerworld's Classified Marketplace!

**For more  
information, call**

**(800) 343-6474**  
(In MA, 508/879-0700)

**COMPUTERWORLD**

Where all computer buyers and sellers go to market



**Innovative, Responsive,  
Quality**

a few words that describe  
the most complete  
computer processor  
offering....

IBM 3090, MVS/XA,  
MSA, DB2, VM/HPO,  
TSO, CICS/VSAM  
and a multitude of  
third party software

**the complete source for  
... outsourcing ...**

**1-800-443-8797**

14300 Sullyfield Circle  
Chantilly, Virginia 22021



# TRAINING

## The great videotape debate

Used properly, video cameras can save firms time, effort—and money

BY JESSICA KEYES  
SPECIAL READER

**F**rancis Ford Coppola or Steven Spielberg they will never be. But information systems training instructors can dash dull technical training classes by adding one of the 20th century's oldest presentational props to their bag of tricks—the video camera.

Video cameras, already available from most companies, are relatively cheap (a standard VHS model can be purchased for about \$699), portable and easy to use. And the ultimate output, the videotape, is inexpensive to reproduce (about \$3 per tape), saves time and money and is aesthetically stimulating to the viewers.

### No personal contact

The most serious drawback to videotaped presentations is the lack of interaction between the viewer and the medium. A trainee can't just stop the tape and ask it a question. Thus, the trainer must decide what topics and in what instances videotape would be the best choice for training.

The following is a guideline of

suggested uses for employing the video camera as a technical training tool.

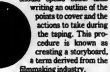
• Record "live" or instructor-led training sessions. This tactic is especially helpful if the topic happens to be highly specialized and technical, or if the training session involves a guest speaker who may not be available at another time.

Also, if the topic is presented in much the same way every time, a videotape can let instructors avoid having to repeat training classes. Recording the session will save the instructor time and the company money. However, trainers must take care that the topic is not one that will frustrate the trainees if there is no interaction.

• Develop a "how-to" training video series. A large percentage of training budgets is allotted for introductory courses of a how-to nature. But by videotaping subjects of an elementary, redundant nature, companies can actually save money to put toward more advanced technical training. For instance, videotapes could be made on subjects such as building a local-area network, configuring a personal

computer or learning about DOS.

The process of developing a how-to videotape series is simple, but it does require some planning. To produce an effective how-to video, the trainer should spend some time



writing an outline of the points to cover and the actions to take during the taping. This procedure is known as creating a storyboard, a term derived from the filmmaking industry.

For example, if a manager is developing a video on how to use a PC, he might create a storyboard as follows: a shot of a computer with a voice-over giving an introduction, then a shot of a person walking over to the computer and turning it on, with a voice-over explaining the term "boot up."

This solution can also apply to training all company employees on a new custom-developed in-house system. Rather than trying to coordinate several live training sessions, employees will have the flexibility to watch an introductory tape at their convenience.

• Produce high-tech multimedia extravaganzas. For complex training requirements, a few extra ingredients can be added to the video training recipe. Many training classes make extensive use of visuals to clarify points as well as add pizzazz. A simple technique is to develop graphics on a PC and videotape the screen.

Television System Committee standard for television and will permit the computer to be linked directly to a video cassette recorder.

One problem with this technique, however, is that voice has to be added to the tape later.

• Capture live presentations and meetings. What do managers do if they've hired a prestigious consulting company to study an important strategic technology issue, and it's coming on-site to expound on its solutions? Managers want their whole staff to hear their eloquence, but half of them cannot attend. The answer, of course, is to videotape it.

Videotaping of

important presentations and meetings serves as an extremely valuable training material. Dispatching a staff member with a pen and pad just isn't sufficient to capture the gist of these important

**R**ATHER THAN trying to coordinate several live training sessions, employees will have the flexibility to watch an introductory tape at their convenience.

However, this is a tricky process: Even good cameramen can't always find the right lighting to prevent glare on the screen. One solution is to use an add-in conversion board, which costs less than \$600.

This board will translate the IBM Video Graphics Array-compatible output to the National

teletext.

While videotaping is definitely not a panacea, nor is it the perfect way to train, it is a viable option for managers to add to their collection.

Keyes is president of New Art, Inc., a management and computer consulting firm in New York.

### COMPUTERWORLD

Training Pages  
give you  
cost-effective  
reach!

That's because Computerworld's Training Pages give you the most widespread reach available to management and staff in America's IS departments—the departments that directly control America's IS training dollars.

And for good reason Computerworld is the best read publication in America's IS departments—the departments that directly control nearly 80% of the \$235 billion US market for all ranges of computer software, hardware, data communications equipment, services and staff.

What's more Computerworld's Training Pages lead buyers to your ad with a weekly editorial feature that anchors the section and your ad. Whether it's topics like "Unraveling the MIS mess," or "Forecasting the training contract," Computerworld's Training Pages deliver pertinent, advice-oriented editorial to Computerworld's readers every week.

Instructor-Led  
Mainframe Training  
and Development  
for IBM and  
related products.

**interact**  
INFORMATION SERVICES INC.

914-332-6100  
(within NY)  
800-629-5471  
(outside NY)

PRINCIPAL CONSULTANT  
TRAINING & DEVELOPMENT  
SERVICES

PRINCIPAL CONSULTANT  
SYSTEMS ADMINISTRATION  
SERVICES

Take Both  
Sections For  
\$119.00

Nonprofit  
101 E. 42nd Street, 10th  
Floor, New York, NY 10017  
(212) 691-2333

Study in a Single  
Source

For Complete Information  
on Training Courses

• PC (Lotus/Ami)  
• PC (Apple)  
• Training  
• Management Reporting

Free Demo Disk  
Call (919) 460-0471  
Computer Consultants  
PO Box 200  
Raleigh, NC 27602

**VIDEO'S  
THE  
ANSWER!**

AL GOL  
C. GOL  
TECHNIQUES

2170 Broadway  
Suite 200  
NY, NY 10006  
212 368-9999

### IBM INSTRUCTION AND MAINFRAME TRAINING

FOR OUR CATALOG OF VIDEO COURSES

IBM INSTRUCTION AND MAINFRAME TRAINING  
DATA COMMUNICATIONS  
APPLICATIONS SYSTEMS  
DATA COMMUNICATIONS

THE KNOWLEDGE EXCHANGE, INC.

WE'RE NOT BILINGUAL  
BUT WE SPEAK ALL LANGUAGES  
WE ARE A REGISTERED TRADEMARK OF THE  
INTERNATIONAL BUSINESS MACHINES CORPORATION

Computer Education at  
**ComputerLand**

of New York/New Jersey

We're not just Hardware!

Call for a FREE course schedule  
(212) 952-1509

Mention this ad for a 12% discount on any course.

### PROMOTING A BETTER UNDERSTANDING OF INFORMATION ENGINEERING

CEC is pleased to present the 1991 public offerings of our Information Engineering courses.

Course	Date	Location	Drop Outlets
IE: Planning	May 6-8	Chicago	\$ 895.00
IE: Analysis	May 14-15	Atlanta	\$ 895.00
	April 15-17	Dallas	\$ 895.00
	May 14-15	San Francisco	\$ 895.00
	June 3-5	New York	\$ 895.00
IE: Design	March 6-8	Atlanta	\$ 895.00
	May 20-22	Detroit	\$ 895.00
	June 17-19	San Francisco	\$ 895.00

For more information about our offerings, please contact the CEC Education Coordinator at:

(313) 569-0900

**CEC**

The CEC Practitioners  
18620 W. 10 Mile Rd. • Southfield, MI 48075-2667

### COMPUTERWORLD TRAINING SECTION

For more information on our offerings, please contact the CEC Education Coordinator at:

(800) 343-6171



# "Our advertising in Computerworld's Classified Marketplace generates high-quality leads from all corners of the world."

— Leslie Klein  
President  
Eurodata Inc.



Eleven years of serious selling and servicing have made Eurodata Inc. of Ottawa one of the oldest Hewlett-Packard dealers in the world — and the largest third-party Hewlett-Packard maintenance organization in Canada. President Leslie Klein knows success like this doesn't just happen. He knows the importance of finding and telling IS managers in organizations everywhere, both large and small, about Eurodata's unique programs for buying, selling, renting, and leasing Hewlett-Packard equipment. And he knows from experience that these IS managers read *Computerworld's Classified Marketplace*.

*"Our advertising goal is to reach all buyers and sellers of Hewlett-Packard computers, terminals, and peripherals. We want to tell them about our timely, cost-effective purchasing alternative. About our \$2 million inventory of the entire Hewlett-Packard computer product line — 1000, 3000, and 9000 series. About how we buy surplus equipment and refurbish everything to meet manufacturer standards for ongoing maintenance. About the first-hand knowledge our employees have of all products, no matter how old or new. About our exclusive service loaner arrangement that guarantees "up" time. And about our multi-faceted disaster recovery service.*

*"To accomplish this, we must reach information systems professionals — decision makers and sophisticated users — because they're generally the most knowledgeable about requirements. I think Computerworld, having established itself as the most prestigious computer publication, goes out to the largest cross-section of readers, many of whom are managers and users of Hewlett-Packard hardware.*

*"Based on the nature of our equipment and the people we're targeting, Computerworld's Classified Marketplace is one of the most appropriate and economical places to advertise — and get results. Our advertising in Computerworld's Classified Marketplace generates high-quality leads from all corners of the world.*

*"All in all, Computerworld's Classified Marketplace gives us everything we need: cost-efficient reach to IS managers in multi-site environments worldwide. That's why Eurodata Inc. is in Computerworld's Classified Marketplace — and there to stay."*

*Computerworld's Classified Marketplace. It's where computer buyers meet computer sellers. Every week. Sellers and buyers like Eurodata Inc. who advertise in Computerworld's Classified Marketplace because it reaches over 612,000 information systems professionals. And because it works. To put your classified message into the hands of America's most powerful audience of buyers, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).*



## COMPUTERWORLD CLASSIFIED MARKETPLACE

Where all computer buyers and sellers can go to market.

## SALES OFFICES

**Senior Vice President/National Sales Director/John H. McCOMBS**, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**REGIONAL VICE PRESIDENTS:** North/Donna Proctor, 10000 West 15th Avenue, Suite 200, Denver, CO 80231. (303) 751-1111. (303) 751-1111. South/John H. McCOMBS, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**CHIEF SALES OFFICER:** Regional Vice President/John H. McCOMBS, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**NEW YORK:** Regional Vice President/John H. McCOMBS, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**LOS ANGELES:** Regional Vice President/John H. McCOMBS, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**San Francisco:** Regional Vice President/John H. McCOMBS, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**Atlanta:** Regional Vice President/John H. McCOMBS, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**Dallas:** Regional Vice President/John H. McCOMBS, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**Philadelphia:** Regional Vice President/John H. McCOMBS, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

## CLASSIFIED ADVERTISING SALES

**Senior Vice President/Classified Advertising/John H. McCOMBS**, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**REGIONAL VICE PRESIDENTS:** North/Donna Proctor, 10000 West 15th Avenue, Suite 200, Denver, CO 80231. (303) 751-1111. (303) 751-1111. South/John H. McCOMBS, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**CHIEF SALES OFFICER:** Regional Vice President/John H. McCOMBS, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**NEW YORK:** Regional Vice President/John H. McCOMBS, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**LOS ANGELES:** Regional Vice President/John H. McCOMBS, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**San Francisco:** Regional Vice President/John H. McCOMBS, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**Atlanta:** Regional Vice President/John H. McCOMBS, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**Dallas:** Regional Vice President/John H. McCOMBS, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**Philadelphia:** Regional Vice President/John H. McCOMBS, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

An IDG Company: The McGraw-Hill Information Services on Information Technology

Frederic Lindstrom

President/President

Computerworld Headquarters: 375 Cockburn Road, P.O. Box 2043, Ft. Lauderdale, FL 33309-1011. Phone: 800-878-8700

McLard

Senior Vice President

Regional Publications Director

Kevin Harrod

Senior Vice President

Regional Publications Director

Andrew Smith

Senior Vice President

Chief Financial Officer

**SALES ADVERTISING DIRECTOR:** Charles J. McCOMBS, Classified Advertising Director, Computerworld Headquarters, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**MARKETING VICE PRESIDENT:** Charles J. McCOMBS, Classified Advertising Director, Computerworld Headquarters, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**PRODUCTION VICE PRESIDENT:** Charles J. McCOMBS, Classified Advertising Director, Computerworld Headquarters, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**ASSISTANT TO THE SENIOR VICE PRESIDENT:** Charles J. McCOMBS, Classified Advertising Director, Computerworld Headquarters, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

## GLOBAL LEADERSHIP NETWORK

### FOREIGN EDITORIAL/SALES OFFICES

**AMSTERDAM:** J. H. McCOMBS, Classified Advertising Director, Computerworld Headquarters, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**BELGIUM:** J. H. McCOMBS, Classified Advertising Director, Computerworld Headquarters, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**CANADA:** J. H. McCOMBS, Classified Advertising Director, Computerworld Headquarters, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**FRANCE:** J. H. McCOMBS, Classified Advertising Director, Computerworld Headquarters, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**GERMANY:** J. H. McCOMBS, Classified Advertising Director, Computerworld Headquarters, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**ITALY:** J. H. McCOMBS, Classified Advertising Director, Computerworld Headquarters, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**JAPAN:** J. H. McCOMBS, Classified Advertising Director, Computerworld Headquarters, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**NETHERLANDS:** J. H. McCOMBS, Classified Advertising Director, Computerworld Headquarters, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**SPAIN:** J. H. McCOMBS, Classified Advertising Director, Computerworld Headquarters, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**SWEDEN:** J. H. McCOMBS, Classified Advertising Director, Computerworld Headquarters, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**SWITZERLAND:** J. H. McCOMBS, Classified Advertising Director, Computerworld Headquarters, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**UNITED KINGDOM:** J. H. McCOMBS, Classified Advertising Director, Computerworld Headquarters, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**UNITED STATES:** J. H. McCOMBS, Classified Advertising Director, Computerworld Headquarters, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

## INTERNATIONAL DATA GROUP, INC.

Robert J. McCOMBS

President/President

William R. Murphy

Senior Vice President

**SALES ADVERTISING DIRECTOR:** Charles J. McCOMBS, Classified Advertising Director, Computerworld Headquarters, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**MARKETING VICE PRESIDENT:** Charles J. McCOMBS, Classified Advertising Director, Computerworld Headquarters, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**PRODUCTION VICE PRESIDENT:** Charles J. McCOMBS, Classified Advertising Director, Computerworld Headquarters, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

**ASSISTANT TO THE SENIOR VICE PRESIDENT:** Charles J. McCOMBS, Classified Advertising Director, Computerworld Headquarters, 375 Cockburn Road, Ft. Lauderdale, FL 33309-1011. (305) 878-8700

# ADVERTISERS INDEX

Ashton-Tate	74
AT&T	44-45, 69-71, 78-79
AT&T Paradyne	36-37
Bell Atlantic	10
BMC Software	24
Cognos	38
Command Technology	39
Computer Associates	3
CW Testimonial	32
CP Reprints	68
DCA	28-29
Digital Equipment Corp.	17-20
Dun & Bradstreet	24
Goel Systems	72
Hewlett-Packard	14-15
IBM	56-57, 64-65, 63
IDC	60
Information Resources	75, 77
Innovation Data Processing	7
Intel	40-41
Legent Corp.	59, 60-61
Micro Focus	35
Multi-Tech Systems	12
NEC	43
Nymex	54-55
Oracle Corp.	9, 13
SAS Institute	26, 33
Software AG	62
Software Engineering of America	11
Software Products International	56
Sun Microsystems	50-51
Symcor	5
3com Corp.	66-67
Texas Instruments	30-31
Universal Data Systems	16
Ventura Publishing	76

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

## Have a Problem With Your Subscription?

We want to solve it to your complete satisfaction, and we want to do it fast. Please write to:

COMPUTERWORLD, P.O. Box 2043, Marion, Ohio 43305-2043.

Your magazine subscription label is a valuable source of information for you and us. You can help us by attaching your magazine label here, or copy your name, address, and coded line as it appears on your label. Send this along with your correspondence.

### Address Changes or Other Changes to Your Subscription

All address changes, title changes, etc. should be accompanied by your address label, if possible, or by a copy of the information which appears on the label, including the coded line. Please allow six weeks for processing time.

### Your New Address Goes Here

Name \_\_\_\_\_  
 Company \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Address shown: ☐ Home ☐ Business

### Other Questions and Problems

It is better to write us concerning your problem and include the magazine label. Also, address changes are handled more efficiently by mail. However, should you need to reach us quickly the following toll-free number is available:

1-800-669-1002

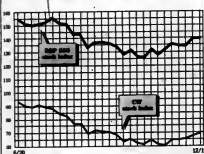
Outside U.S. call (614) 365-3382



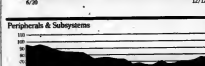
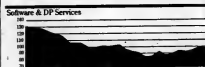
COMPUTERWORLD

P.O. Box 2043, Marion, Ohio 43305

## STOCK TRADING INDEX



<i>Index</i>	<i>Last Week</i>	<i>This Week</i>
Communications	106.0	107.4
Computer Systems	67.4	66.9
Software & DP Services	99.9	98.5
Semiconductors	43.6	42.6
Peripherals & Subsystems	77.3	75.4
Leasing Companies	47.1	54.2
Composite Index	67.9	69.0
S&P 500 Index	139.4	139.5



## Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, DEC. 12, 1900

FIRM	RANK	PRICE		MKT	PERF
		52 WK	12	CHNGE	CHNGE
		LOW	HIGH		
<b>Communications and Network Services</b>					
AMERICAN TELEPHONE CORP	70	53	66 1/2	1.4	2.9
AMERICAN TEL. & TEL. CO.	71	51	71	1.0	3.3
AT&T	67	90	105 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	68	50	60 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	69	49	59 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	72	48	58 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	73	47	57 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	74	46	56 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	75	45	55 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	76	44	54 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	77	43	53 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	78	42	52 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	79	41	51 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	80	40	50 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	81	39	49 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	82	38	48 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	83	37	47 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	84	36	46 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	85	35	45 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	86	34	44 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	87	33	43 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	88	32	42 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	89	31	41 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	90	30	40 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	91	29	39 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	92	28	38 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	93	27	37 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	94	26	36 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	95	25	35 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	96	24	34 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	97	23	33 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	98	22	32 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	99	21	31 1/2	3.3	0.8
AT&T WORLDWIDE COMM.	100	20	30 1/2	3.3	0.8

### Computer Systems

[illegible]

### Software & DP Services

[illegible]

## Semiconductors

N	ADV-MORRIS DEVICES INC	11	4	8.75	0.3
N	ANALOG DEVICES INC	10	8	6.75	0.4
N	ANALOG OSC INC	14	6	6.5	0.3
N	CHIPS & TECHNOLOGIES INC	24	4	-0.1	-0.1
N	INTEL CORP	52	28	16.75	1.8
N	MICRON TECHNOLOGY INC	18	7	12.25	1.4
N	MOTOROLA INC	98	48	52.5	3.5
N	WAT. SCIENCE/TECHNOLOGY	6	3	4.25	0.2
N	TEXAS INSTRS INC	44	23	36	0.3
N	WESTERN DIGITAL CORP	16	4	8.75	0.4

### Peripherals

[illegible]

### Leasing Companies

CAPITAL ASSOCIATES INC	8	0	0.000	0.3	57.1
COMERCO INC	26	18	18.125	0.1	0.7
LIJ CORPORATION	17	9	12.25	1.4	12.8
GOV. ELECTRONICS INC	7	3	2.75	0.0	0.0

## Bargain buys

**Wall St. shoppers found deals in high-tech market**

Investors shopped for sale items in the technology arena last week, taking advantage of recent price drops while the taking was still good. Among the apparent bargains was Stratus Computer, Inc., which traders thrust up 1 3/4 points last week to 24 1/4 by Thursday's close.

Evidently, Novell, Inc. was also a good buy after it reported fourth-quarter profits had doubled, compared with the same period in 1989. Novell shares gained a point last week to 32 3/4.

Adaptec, Inc. turned investors off, however, as it projected sagging earnings in the quarter to come. Adaptec dropped 5½ points for the week, closing Thursday at 94. Other software issues were also without takers, including Microsoft Corp. and rival Lotus Development Corp. Lotus slipped 1½ points to 19, while Microsoft fell 1½ points to 72½.

The computer industry's soap opera starring AT&T and NCR Corp. continued to capture audiences' attention on Wall Street. Watchers flip-flopped, however, sending NCR down and AT&T up last week, after the opposite had happened the week before last. AT&T regained 1 1/4 of the 2 points it had lost the previous week, closing Thursday at 31. Similarly, although NCR shot up the week before last, it sank 1 1/4 points last week to close at 90 1/4.

Meanwhile, bellwethers IBM and Digital Equipment Corp. sent mixed signals. IBM inched up ¾ of a notch to 112%. As news spread of DEC's money-saving scheme for the coming year — which includes executive shuffles and possible layoffs throughout the company — DEC stock faltered, losing ¾ of a point to close at 56½.

Elsewhere, semiconductor firms Advanced Micro Devices, Inc. and National Semiconductor Corp. each picked up  $\frac{1}{4}$  of a point, closing at 4 $\frac{1}{4}$  and 4 $\frac{1}{4}$ , respectively. Intel Corp., however, lost  $1\frac{1}{2}$  points, closing at 36 $\frac{1}{4}$ .

KIM S. NASH

## NEWS SHORTS

**Sears pushing EDI with suppliers**

Sears, Roebuck and Co.'s Merchandise Group, the nation's largest retailer, will begin mailing letters this week to its suppliers telling them when the company will expect them to be able to engage in ANSI standard electronic data interchange (EDI). Lance Dickey, director of EDI implementation at Sears' Merchandise Group, said suppliers will be expected to be up and running within 90 days of receiving the letter. Executives at several suppliers spoken with at a Sears-EDI seminar were positive about the move, saying that it marked Sears' break with its proprietary network, Sendex.

**DEC unveils 5¼-in. disk systems**

Digital Equipment Corp. announced a new generation of 5¼-in. high-performance removable disk storage systems last week for its low- to mid-range computers. The removable storage element subsystems come in two configurations — the 4-kbyte RP72-RSE and the 384-kbyte RP31-RSE — and are based on DEC's 5¼-in. Winchester disk drive with built-in controller. Prices range from \$7,600 to \$16,900, with availability 60 days after ordering.

**FAA stops, restarts project**

A 10-year plan for outsourcing the Federal Aviation Administration's administrative computing was withdrawn last month, but a new request for proposals will be out this week. The original plan was hotly criticized by the General Accounting Office, and the FAA's authority to proceed with it was temporarily suspended this summer. Mike Sherwin, director of management systems at the agency, said the plans were basically the same, but the details will be different.

**Amdahl pushes up UTS 2.1 delivery**

Amdahl Corp. jumped its first-quarter 1991 schedule for delivering UTS Release 2.1, the latest version of its mainframe-based Unix operating system, by announcing immediate availability. UTS 2.1 complies with AT&T's Unix System V Release 3.1 and incorporates some features of Unix System V, Release 4 and Berkeley Unix BSD Release 4.3. Early UTS 2.1 user sites included US West Communications, Grumman Corp. data centers that support the National Aeronautics and Space Administration's Johnson Space Center and AT&T.

**Ask/Apple team yields Smart/Look**

Ask Computer Systems, Inc.'s Ingres Smart/Look and Apple Computer, Inc. have developed Ingres Smart/Look, which allows character-based applications developed with Ingres Corp. tools to run on Macintoshes, complete with the traditional Macintosh look-and-feel. Smart/Look will initially run on a DEC VAX computer, but support for Unix host systems will follow. Ask said. Smart/Look is priced at \$395 for a package that runs on the VAX host; an additional license fee of \$395 is required for each Macintosh that is supported.

**Netframe shows 250-user server**

Netframe Systems, Inc. unveiled its Intel Corp. 486-based NP200 server, designed to handle local-area networks of as many as 250 users that have evolved beyond file sharing and communications applications to encompass SQL database processing. The base price for the NP200 is \$26,950 with immediate availability.

**Diebold buys into IBM's tollers**

The terms were not disclosed, but the deal is done: As of late last week, Diebold, Inc. is the owner of those assets of IBM's automated teller machine (ATM) service business necessary to let Diebold fully support all U.S.-based IBM ATMs. The Canton, Ohio-based self-service transaction automater said it expects the acquisition to swell its customer service revenue by approximately 10% when the new service goes into full swing.

# Users mostly unfazed by Officevision delay

BY ROSEMARY HAMILTON  
and PATRICIA KEEFE  
OF STAFF

When IBM delivers its scheduled status report on Officevision this week, it is expected to announce the second major delay for its strategic office system platform. However, customers and analysts contacted last week shrugged off the bad news.

"Who expects it to ship on time anyway?" quipped David Coarsely, an analyst with the Gartner Group, Inc.

But the low-key reaction is not all good news for IBM. While some users contacted said they are not worried about IBM's schedule because they are slowly ramping up with Officevision themselves, others noted they had already decided to put off plans to implement Officevision, which some say does not work.

Users have not given up, but they are frustrated, said John Duane, an analyst with Workgroup Technologies, Inc. He predicted that 1991 will be a critical year for Officevision. If IBM fails to deliver some key, working pieces of the off-line development, it runs the risks of losing accounts to alternative electronic services, such as Hewlett-Packard Co.'s New Wave or NCR Corp.'s Cooperation.

For the already skeptical, the second product delay reinforces the earlier decision. "It just confirms we made the right decision," to go with Wang Laboratories, Inc. equipment a long time ago, said David Moore, a senior vice president at Mellon Bank Corp.

"We looked at Officevision, and it just does not fit our business needs," said Enrique Cre-

spo Jr., corporate manager of computing service at Torrington Co., a "90%" IBM shop. Crespo is specifically disappointed in Officevision's lackluster support for MS-DOS. "I don't think it's ready for the public."

An IBM spokesman con-

firmed last week that the company will release a status report on Officevision this week, but declined to provide details (see story below).

Some industry sources have said IBM will be late by as much as several months in delivering the critical second release for all four Officevision platforms.

"I think IBM's big mistake was not in trying to do it, but in making a public commitment for when it would be ready," said Amy Wohl, president of Wohl Associates.

## Delaying tactics

IBM's expected announcement of a revised Officevision schedule this week will probably downplay delays by repositioning the critical second release of the platform.

For starters, the company is expected to focus on OS/2 Release 1.3 Extended Edition, particularly for its LAN platform. Therefore, Officevision LAN Series Release 2.1 will be attached to the delivery of OS/2 Release 1.3 for LANs, which is not expected until March 1991.

This is a departure from the long-standing plan to release Officevision for OS/2 Release 1.2 although industry sources said they are not clear why this shift would cause any technical delays. Release 2 of Officevision for the LAN platform is particularly important because it will provide many more office functions and the ability to map in third-party applications.

It is also considered by many industry analysts to be the heart of IBM's future office strategy, because it focuses on the desktop environment.

"Being able to do E-mail on MVS is not strategically important to IBM," said Stuart Woodring, an analyst at Cambridge, Mass.-based Frontier Research. "What is important is to address the needs of OA in an architecture that reflects the 1990s, and that's the LAN version."

Meanwhile, an IBM spokesman indicated that the company will also likely start pushing a more modular approach to Officevision Release 2, particularly for the host platforms.

But the big news about it was the OS/2-to-server direct connect component. Plans are under way to separate this OS/2 direct connect component and position it as a distinct feature, the IBM spokesman said. The company can then ship what is technically Release 2 software, although it will not have what had been a key piece.

In fact, IBM quietly began shipping what it calls Officevision/MVS Release 2 in September. Two users contacted last week, one of whom just installed Release 2, said it has no OS/2 direct connect support but appears to have a performance kick and comes with a feature called the Enterprise Address Book.

ROSEMARY HAMILTON

## D&B Software to increase services

BY SALLY CUSACK  
OF STAFF

NATICK, Mass. — Falling in step with the recent industry trend of placing customers stop visible pedestals, Dun and Bradstreet Software said last week that, beginning next year, its 10,000-plus clients will receive extended professional and maintenance services. They will also have opportunities to interact one-on-one with D&B Software executives.

In addition, D&B Software Chairman and Chief Executive Officer John P. Inlay Jr. recast his executive team, hiring former McCormack & Dodge (M&D) Executive Vice President John Landry to the company

that was formed last year from the merger of M&D and Management Science America, Inc. Landry has been D&B Software's executive vice president, but will be responsible for research and development initiatives.

Landry has also promoted D&B Software Executive Vice President Henry P. Holland to president and chief operating officer and recruited Michael Choules, formerly a vice president at Boston-based financial firm Bain & Co., as executive vice president for strategy and

business development.

Paul Zaganais, a senior analyst at The Yankee Group, a research and consulting firm in Boston, noted that D&B Software's reorganization may be a prudent one, but he cautioned that the software business is a "different ball game these days."

"Vendors have to establish an outsourcing relationship with the end user — and they have to be willing to share some of the revenue" in purchasing, designing and implementing these products," Zaganais said.



D&B Software's Landry has been in charge of research and development

## Further study of VDTs needed, EPA reports

BY J. A. SAVAGE  
CIVILIAN

There are enough indications of health risks from the type of electronic fields emanating from VDTs to justify significant new studies, the U.S. Environmental Protection Agency (EPA) concluded in a report that was released Friday.

The external review draft of the "Evaluation of the Potential Carcinogenicity of Electromagnetic Fields" concluded that there is an "elevated risk" of a link between cancer and electromagnetic fields created by the electricity in everything from VDTs to high-voltage wires. The draft also said there appears to be a link between various biological changes at the cell level and exposure to the fields, according to Martin Halper, director of the analysis and support division of the EPA's Office of Radiation.

The report also noted that while there are indications of a link, "the interaction between electromagnetic fields and cancer is not understood."

The EPA, which has been waiting for the conclusion of this report, has yet to set aside funds for new studies, according to Halper.

Because of the interest in electromagnetic fields from power lines, a group of utilities has offered to create a voluntary

fund to pursue more studies.

The report is expected to create so much interest that the White House Science Advisor's office and White House Chief of Staff John Sununu have held it up

### Burning rays?

Questions about the health effects of VDTs remain unanswered despite their increased use



U.S. installed base of VDT screens		
	1989	1990
Terminals	13.7M	13.5M
PCs	30.7M	35.7M
Total	64.4M	69.2M

Source: International Data Corp.

CW Chart: Paul Mack

from public release since Nov. 27.

One of the reasons given to the EPA by the White House was fear of alarming people, confirmed EPA project manager Robert McCaughy and an EPA spokeswoman. "It does affect everyone," he said.

"This is a very difficult area that, I am sure you agree, requires careful treatment if we are to serve the public well," wrote White House Science Advisor D. Allan Bromley in an August memorandum to the head of the EPA. Union organizers had

the EPA report is the kind of ammunition they need to get greater health protections for VDT workers.

However, a lack of solid information has unions backed off from some electromagnetic-related demands, such as work transfer during pregnancy.

"We just haven't had the ammunition," said Barbara Kellogg, an organizer at the Service Employees International Union in San Francisco. She said anecdotal reports of problems in the workplace, such as clusters of birth defects or stillbirths, reach her office, "but there is no documentation."

### Not convinced

Despite EPA findings and pressure from unions, many companies that employ large numbers of VDT workers remain largely unconvinced of potential health effects on their workers based on scientific information available.

"None of the studies to date prove anything," said Terry Thompson, senior attorney at AT&T in Basking Ridge, N.J. "We think there is no foundation for fear."

"We have experts looking at this, but scientific data are inconclusive," a Pacific Bell spokesman said.

Previous studies have been largely inconclusive, because studying electromagnetic effects is nothing like looking for the effects of a chemical, according to Halper.

"It looks like it's a breaking every rule established for dealing with chemicals," he said. "Forget linear threshold models and

## VDT regulations adopted

BY J. A. SAVAGE  
CIVILIAN

SAN FRANCISCO — San Francisco's Board of Supervisors voted eight to one last week to adopt legislation governing adjustable workstations and chairs, among other requirements, for employers who have more than 15 workers who use VDTs.

The body constituted legislation was passed with major compromises to employers in an effort to keep them from leaving the city, according to supervisor Nancy Walker. "We don't want to have moving vans pull up," she said.

The legislation will be heard for a second reading this week and must be signed by Mayor Art Agnos, who has given no indication whether he will accept or veto it.

Employers would have two years from the date the legislation passes to conform to its requirements, and an advisory board will be able to suggest re-

visions to the legislation.

The city's budget analyst, Harvey Rose, said the current version of the legislation would cost the city and businesses \$37.6 million less than the original estimate of \$70 million to \$120 million.

### A space saver?

The savings are mostly from cutting out the provision that VDTs be placed no closer than five feet from each worker, which would have caused employers to acquire more office space for employees.

The Chamber of Commerce continues to oppose the legislation, despite being included in compromises between labor unions and the city. "We will encourage the mayor to veto it," a Chamber spokeswoman said. She added that major corporations in San Francisco, such as Wells Fargo Bank NA, United Airlines and R.H. Macy & Co., are reviewing legal action on the issue with their law departments.

lifetime average daily doses; then we can begin talking about electromagnetic fields."

There will be a 90-day period during which the EPA will accept comments from the public regarding the report. Then it goes to a second review committee made up of scientists from 18 federal agencies.

The EPA report deals with extra low frequency (ELF) fields, which emanate from VDTs as well as power lines and

appliances. ELF's range from 30 Hz to 3,000 Hz.

VDTs also give off another level of electromagnetic field, called very low frequency, that field is not covered in the report, according to McCaughy. The report is, however, being studied by the National Institute for Occupational Safety and Health for potential reproductive effects.

CW Chicago bureau chief Eliza Boeber contributed to this story.

## User group joins COS

BY GARY H. ANTHES  
CIVILIAN

MCLEAN, Va. — The User Alliance for Open Systems, originally known as the Houston 30, announced last week that it has become part of the Corporation for Open Systems (COS) based here. The alliance joins a growing number of user-oriented units within COS whose mission is to pool their constituencies and write requirements for the vendor community.

E. W. "Bud" Huber, chairman of the alliance, said the group has received inquiries about membership from 835 user and vendor companies — about 90% of which are in the U.S. "At the end of 1991, I'd be happy to have 100 active people working in the alliance," he said.

Corporate members with sales above \$15 million will pay \$25,000 in yearly dues, while smaller firms will be assessed \$9,500. "Allies" — essentially, recipients of COS and User Alliance information — will pay \$2,000 yearly, and unaffiliated

individuals may pay \$150. The dues structure is an apparent response to earlier concerns that the \$25,000 COS dues would bar smaller companies from participating in the User Alliance.

According to Huber, eight major organizations have joined the COS User Alliance.

### Holding back

However, others who had attended the user coalition's meeting this year are holding back. One of these, General Electric Co., said it has no plan to join because it found that COS was too vendor-oriented when GE was a member. "The people at GE didn't feel COS had a user orientation and didn't think COS served GE's interest very well," said Duane Elms, program manager of technical computing at GE. However, Elms said he will join as an individual. "In spirit and in effort, we'll support what goes on."

Huber said the alliance will implement a list of "action items" for bringing down the barriers to open systems.

## Judge

FROM PAGE 1

merits of the case," he said.

Lyons claimed there was no deliberate intention to mislead the copyright office. "The attorney who filed the original application in the early 1980s has testified in depositions that he did not mention JPLDIS in the application simply because he had never heard of it," Lyons said. Lyons also added that the copyright office would still have issued the copyright even if the JPLDIS was mentioned.

Some observers said Hatter's decision has the potential to affect other cases involving artistic inspiration. Apple Computer, light of a long copyright battle with Microsoft Corp. and Hewlett-Packard Co. in which it has charged the pair with copying its Macintosh screen appearance. The defendants, however, have countercharged that Apple based the look of the Macintosh on work done by Xerox Corp. at its Palo Alto, Calif., Research Center in the 1970s.

Officials from Torrance, Calif.-based Ashton-Tate said

the original suit filed in November 1988 alleged that Fox's Foxbase product unlawfully copied Dbase's concept, "look and feel," programming language, sequence of events and arrangement of the program as presented to the end user. The legal action sought an injunction against sales and unspecified damages.

### No clear precedent

While there is established legal precedent protecting a program's screen appearance, there has never been such a precedent for claiming proprietary rights to a programming language or a program's sequence of events. Opponents argued that such a ruling could threaten the open base of all programming.

"This certainly removes a cloud from the database world," said Dave Fulton, president of Perryburg, Ohio-based Fox. "Now we'll be able to standardize the whole environment and mature like computer applications."

There are currently 10 vendors marketing Dbase language compilers and interpreters. Four of these — Ashton-Tate, Fox, Wordtech Systems, Inc. and

Nantucket Corp. — hold more than 90% of the Dbase-compatible market.

Wordtech President David Miller added, "It ensures that Dbase is not a 'single-source' solution for purchasers, but rather a multi-source solution with many suppliers."

However, Ashton-Tate's user base proved its loyalty during the 18-month period when the most recent release of Dbase was pulled from the market to fix a serious bug.

"The reason I have stuck by Dbase is because of everything that can be done with it," said Rock Blasco, IS vice president at Garber Travel in Boston. "Price is one of the least things I consider."

Some analysts downplayed the news because they said the most important issues remained unresolved. "The judge never really addressed the basic question of whether you can or cannot copyright a language, so we may not have had that much of a precedent here," said David Mayer, an analyst at Montgomery Securities in San Francisco.

CW staff writer Carol Hildebrand contributed to this story.

## DG founder resigns; possible ouster seen

BY SALLY CUSACK  
CW STAFF

WESTBORO, Mass. — Another era ended last week as Data General Corp. founder and Chairman Edon D. de Castro announced that he will leave the company Dec. 31. He will not stand for reelection to the board.

"Obviously, there is a certain element of disappointment," de Castro said, referring to his departure amid speculation that his decision was being forced by the board of directors. "Frankly, though, I'm anxious to get back to work. I'm not the type of person that can sit around and do nothing."

De Castro, engineer and entrepreneur, left Digital Equipment Corp. in 1968 to found DG, where he served as president until he was named chairman of the board and chief scientist in 1989, a position insiders said gave him figurehead status and little hands-on involvement in the company.

De Castro, L. Skates, who was named president and chief executive officer in 1989, will continue to lead DG in that capacity, the company said.

According to Carolyn Griffin, a senior analyst at International Data Corp., a Framingham, Mass.-based market research firm, the transfer of power from de Castro to Skates has been in

the works for a long time.

One longtime DG customer at a manufacturing facility added, "I don't think he has been actively involved in the day-to-day business for quite some time, so I really don't think it will affect us as customers at all. The only positive thing I see is that perhaps Wall Street investors will see this as a definite sign that things are going to change."

De Castro indicated he will be aggressively searching for new ventures and will consider several possibilities in the near future.

DG also announced that Vice Chairman Herbert J. Richmond, the man who created DG's hard-hitting sales force, will not be standing for reelection.

Referring to de Castro as an "industry legend," Skates credited both the former chairman and Richmond for making DG a leader in the industry and added that de Castro's leadership, technologically superior products and "dedication to excellence" has earned Data General a reputation for quality and reliability.

Reflecting back on missed opportunities, de Castro said his greatest mistake was not getting into the personal computer business during its infancy, adding that it is a gargantuan dilemma to become "so focused on the success of the day, you fail to look at options for the future."

Referring to de Castro as an "industry legend," Skates credited both the former chairman and Richmond for making DG a leader in the industry and added that de Castro's leadership, technologically superior products and "dedication to excellence" has earned Data General a reputation for quality and reliability.

## Can Avion save crippled DG?

Analysts say \$100 million in workstation sales won't carry company

BY SALLY CUSACK  
CW STAFF

WESTBORO, Mass. — With each disastrous financial report, Data General Corp. struts out an executive to say that sales of its Avion workstation are "gaining momentum," and to confirm that the company is banking on its reduced instruction set computing (RISC) Unix-based machine to pull it out of the red ink.

The question is, in today's bleak financial climate, will Avion sales move fast enough to worth the limping corporation?

While DG boasts \$100 million worth of Avion sales for 1990, analysts agreed that the numbers are not substantial enough to carry the \$1.3 billion entity. Industry experts estimated that there are several thousand Avions currently installed in the U.S. and abroad, but that still gives the company a small market share in an extremely competitive RISC market — probably less than 1%.

The latest twist is that DG is no longer stridently positioning the Avion as a workstation.

"We cannot compete on a head-to-head basis with Sun, HP and DEC in the workstation marketplace," said William Zastrow, DG's new vice president of Open Systems Marketing.

Citing Sun Microsystems, Inc., Hewlett-Packard Co. and Digital Equipment Corp.'s significant presence in workstation installations, Zastrow said DG will dominate targeted vertical markets, with the Avion functioning in a server capacity.

"We're going to be a leader in

the medium- and large-scale enterprise server market," Zastrow said, adding that workstation sales would naturally follow because of the architecture's binary compatibility.

Avion customers, although small in number, reported they are happy with the product. "The Avion is truly excellent in terms of reliability," said Tom LaMarche, data systems manager at the Maricopa County Flood Control District in Phoenix. Last year, it installed seven Avion workstations and an Avion 5300 Server to run its Geographic Information Services (GIS) applications.

"Of course," LaMarche added, "like other people, we worry about DG's financial condition, especially through the recession."

### Can't get enough

According to David Lundquist, vice president at Mercy Health Care Center in Oklahoma City, Avion installations at the facility have gone "extremely well. Right now, we're behind schedule as far as people who want to sign onto the system."

The future of DG and Avion seems to rest on how fast and how many value-added services and software applications will be available on the Unix-based platform, coupled with whatever value-added services the company can provide.

"The Avion has to be the mechanism for survival," said George Weiss, an analyst at Gartner Group, Inc., a Stamford, Conn.-based market research and consulting firm.

"With the economy slowing down, even the big guys like Digital Equipment Corp. have been having trouble," said Lisa Thorcell, an analyst at Datquest, Inc., a market research company based in San Jose, Calif.

Noting that the company has recently scored some major wins, including a \$45 million contract with U.S. Sprint Communications for Avion 100s, and has won its appeal on the much-publicized contract bid for government GIS-related installations, Thorcell cautioned that DG "can't afford to make any mistakes at this point. They're coming up from behind."

According to DG, more than 400 software developers have agreed to port their applications to the Avion line, which eventually give Avion users more than 1,000 applications to choose from. There are also approximately \$50 value-added resellers currently partnered with DG, and a recent agreement with Software, Inc. in Wayne, Pa., to build a switching product on the Avion is an example of the vertical approach DG is taking to market its product.

Michael D. Zimman, president of Software, said his company was looking for a Unix-based platform last year and chose the Avion because of its strong communication stacks capabilities. Zimman does not perceive DG's ailing financials as a threat to the product. "We didn't commit to a proprietary architecture, but to a platform. If the Avion disappeared tomorrow, 95% of the software architecture can be ported to another system."

## DEC weeds out employee base, offers severance pay

BY MARYFRAN JOHNSON  
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. announced last week a key executive shuffle, in part to both simplify the corporate mass and provide better field service for its customers.

The company also inched a step closer to the possibility of

employee layoffs in early 1991. A \$1 billion cost-cutting effort now under way is forcing close scrutiny of every expenditure.

DEC's voluntary severance program has 7,000 employees considering whether to quit, or move to other jobs within the company, according to spokeswoman Nikki Richardson. At the end of this month, managers will

evaluate the results of the program, which has cut the worldwide staff of 125,900 by 3,200 in 1990.

Layoffs are not out of the question, but there has been no decision to have a layoff, Richardson stressed.

In the executive shifts, Russell Gullotti moved into the vice presidency of the newly created

Corporate Services, which pulls DEC's worldwide systems integration and support services under one senior manager. Donald Zerkel, formerly vice president of customer services, is now vice president of all U.S. sales and services, including product delivery and management activities.

David Granger, formerly head of the sales organization, was appointed vice president of customer new creation; an OEM/VAR Business Group with global responsibility to expand DEC's indirect sales channels. All three executives report to Jack Smith, senior vice president of operations and right-hand man to DEC President Kenneth H. Olsen.

"We could call this one more flailing attempt to get DEC moving again," said Robert Herwick, an analyst at Hambrecht & Quist, Inc. in San Francisco. "Hopefully, this means there will be less redundancy, less coming

back to customers to do what they should have done in the first place."

If the executive changes bring about the promised improvements in the field, DEC users would have much cause for rejoicing, several analysts say.

Customers have often bemoaned the quality of their sales representatives, noted Michael Artukowicz, systems support supervisor at Health and Tennis Corporation of America in Los Angeles.

Artukowicz said the majority of users he spoke with have "many complaints about their sales reps."

"If DEC will survive, they will have to revamp their sales organization," he said. "I've dealt with smaller, third-party subsystem manufacturers, and DEC should take lessons from companies like that, who stay in tune with their user base, understand what the user needs and respond to it."

Senior writer Allen Ryan contributed to this article.

Second-class postage paid at Framingham, Mass., and additional mailing offices. Computerworld (ISSN 0191-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing, Inc., 733 Goshen Road, Box 9171, Framingham, Mass. 01701-9171.

Copyright 1990 by CW Publishing, Inc. All rights reserved. Computerworld can be purchased on 35 mm microfilm through University Microfilms Int., Periodical Dept., 300 Zoo Road, Ann Arbor, Mich. 48106. Computerworld is indexed/abstracted by CompuServe, Inc., 10000 E. 17th Ave., Suite 100, Denver, Colo. 80202.

Photocopying: permission to photocopy for internal or personal use, or the internal or personal use of specific clients is granted by CW Publishing, Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of \$5.00 per copy of the article, plus \$5.00 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, Mass. 01970. 508-744-3200.

Reprints (minimum 500 copies) and permission to reprint may be purchased from Sharon Bryant, CW Publishing, Inc., 733 Goshen Road, Box 9171, Framingham, Mass. 01701-9171. For back issues contact Margaret Melillo.

Subscriptions rates: \$200 a year; U.S. — \$44 a year; Canada — \$110 a year; Central & S. America — \$130 (barter); \$250.00 (annual); \$150 a year; Europe — \$250 a year. Five weeks notice is required for change of address.

Allow six weeks for new subscription service to begin. Subscriptions will bill from 1000-689-1802.



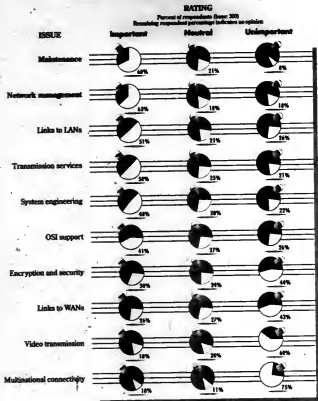
POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, P.O. Box 2044, Marlton, NJ 08053.

## TRENDS



# NETWORKING Wish List

Maintenance and network management get high marks when users list which networking issues are most important



Source: Link Strategies Corp., New York

EW Chart: Duane St. John

## NEXT WEEK

**E**lectronic data interchange has the potential to transform the way television stations sell advertising, and Joe Harris, director of information technology at NBC-TV Stations, is one executive leading the charge. However, there is plenty of resistance and defense of the old ways of doing business in the TV industry. See Manager's Journal.



**F**orecast 1991, a special year-end double issue, looks at the key issues facing information systems management in the coming year. You'll get practical tips for stretching your IS dollar and research on the hottest technologies and companies to watch in 1991. Plus, 1990 all-star team, job outlook and our 4th annual dubious achievement awards.

## INSIDE LINES

## This one got away

Dun & Bradstreet Software has apparently lost its bid for Wright Systems, a privately held Michigan-based software house. The company was acquired outright by Integral in Walnut Creek, Calif., in a deal that was formalized on Dec. 7. Lee Wright, president of Wright Systems, will serve on Integral's board as well as take on the title of chairman of the firm's Integral Midrange group. David Snyder, executive vice president at Wright Systems, will also be joining the corporate executive staff at Integral.

## Get Blue, get open

IBM is actually threatening to leapfrog DEC on the Open Systems Interconnect (OSI) support track by coming up with common programming interfaces that will allow users to port messaging and file-transfer applications across both Systems Network Architecture and OSI, a user tells us. IBM already offers a common programming interface for porting transaction processing applications across LU6.2 and OSI, but this would broaden its ability — which DEC reportedly lacks — to shelter application developers from the differences between OSI and its own proprietary upper-layer protocols, the user says. IBM is apparently preparing several major OSI announcements.

## When it rains . . .

Are more layoffs in the offing at Wang? Rumors have been heating up the airwaves and the Lowell, Mass., local newspaper. When Wang President Rick Miller was in San Francisco last month, he responded to a question about layoffs by saying there were no such plans on his desk. However, a source said Wang is looking especially carefully at a number of areas, including customer engineering and research and development. "A customer engineer told me they are tracking [them] real close, checking to see how many calls they make, how much time they spend on accounts," a source said. Separately, there are reports that research and development, particularly in platform engineering, may be cut 30% to 35%.

## The Ballad of OS/2, part 157

Far from the unwavering facade presented to users, a wavering Microsoft moves forward with LAN Manager Version 3.0. A consultant who has preliminary paperwork on the next edition says every reference to OS/2 on the original document was scratched out. Meanwhile, Microsoft is also busy on the language front, where it is said to have inked an OEM deal with DEC, under which DEC will private-label Microsoft compilers. On the operating system front, while users await DOS Version 5.0, reports are already circulating about DOS Version 6.0, which includes built-in Windows.

## Was Mr. Olsen seen leaving the building?

Where there's a smoke . . . IBM's Business Recovery Services Division had a nasty surprise Tuesday, when a connection between two electric company power grids shorted out just outside the disaster-recovery service's headquarters in Tampa, Fla. Ironically, the dual-power grid "feed" to the disaster-recovery center is intended to ensure continuous operations. IBM's computers kept on humming, running on battery power, but electricity wasn't restored for more than one hour. Dozens of people were evacuated from the site — including those running backup and recovery tests in the computer room.

## The stockings were hung . . .

Still looking for an industry-related stocking stuffer? Borland Chief Executive Officer Philippe Kahn and a handful of friends and coworkers have released a compact disc entitled "Pacific High." The 73-minute CD features 23 numbers, ranging from New Age mood pieces to "Turbo Turbo," a rap song offering nods to Borland's Turbo C++ programming language. The package is slicker than motor oil — but don't quit your day job, fellas.

We'll be rapping about holiday cheer for the next week or so, but we're never too festive to take your tips and opinions. Call them in to News Editor Peter Bartisak at (800) 343-6474, message COMPUTERWORLD on MCI Mail or fax us at (508) 875-8931.



# If you think the LaserPrinter E looks good in person,



## wait till you see how it looks on paper.

	The IBM LaserPrinter E	HP LaserJet IIP
Speed	✓ up to 5 ppm	up to 4 ppm
Speed upgrade option	✓ up to 10 ppm	No
Adobe PostScript option	Yes	Yes
Printer emulation	✓ IBM, HP PCL	HP PCL
Std. plotter emulation	✓ Yes	No
Font card slots	✓ 2	1
Std. input paper tray capacity	✓ 200	50
Std. output paper tray capacity	✓ 100	50
Opt. sec. input paper tray capacity	✓ 500	250
Opt. envelope tray capacity	✓ 75	20
Mfr. sugg. retail price	✓ \$1495	\$1495
Less rebate (dealer prices will vary)	✓ \$1420	—

Any way you look at it, the IBM LaserPrinter E gives you more for your money than any other laser printer in its price range.

And now for \$75 less\* than the HP LaserJet IIP, the award-winning IBM LaserPrinter E gives you all the advantages of laser quality output 25% faster, with four times the paper capacity, twice the number of font slots and double the monthly usage volume.

Plus the IBM LaserPrinter E is unique in its price range because it lets you customize your printer's speed and features to meet your exact needs, at any given moment.

All of which makes the IBM LaserPrinter E the only affordable laser printer that lets you buy now and grow later.

For example, if you decide you want faster printing, only the LaserPrinter E lets you double its speed.

Or if your software requires the Adobe PostScript® language, the LaserPrinter E can also give you that creative flexibility for less money.

Or if you decide you could use automatic collating of letterhead, second sheets and envelopes, the LaserPrinter E lets you add that, too.

Yet no matter how many features you add,

the LaserPrinter E's unique stackable design takes up practically no more desk space.

So whether your first requirement is price, performance or flexibility, the IBM LaserPrinter E should be at the top of

your shopping list. See it today by calling 1 800 IBM-2468, ext. 982, for the name of your nearest IBM Authorized Remanufacturer.

The IBM LaserPrinter E. Suddenly, nothing else measures up.

It's not surprising that two can sometimes accomplish things that one never could. What is surprising, however, is just how beneficial the merger of McCormack & Dodge and Management Science America (MSA) promises to be.

Together they are combining their talents and energies, along with an unprecedented wealth of experience, to fortify D&B Software

**On March 1, 1990  
MSA Software Merged With  
McCormack & Dodge  
To Become  
Dun & Bradstreet Software.**

With more than one-third of the staff committed to servicing and enhancing your existing software, D&B Software will thoroughly protect your investment. And the company works with more than 10,000 customers worldwide. That means unmatched proficiency in dealing with problems, and knowing what works and what doesn't. While raising customer satisfaction to new heights.

The merger will have unexpected benefits in other ways as well. The R&D budgets and expertise of the two companies are now

**MSA**  
The Software Company

combined. So you can be assured that D&B Software is extraordinarily equipped to help you navigate the tremendous technological changes that lie ahead. Doing so by enhancing current products. And by providing clear migration paths to the next generation of software.

D&B Software will also make certain you aren't left behind in an increasingly global marketplace. Because, with the resources of two companies, your needs can now be attended to in more

**McCormack & Dodge**

than 60 countries with a network of seasoned company representatives. And the software solutions themselves are designed to operate worldwide on all major hardware platforms.

D&B Software is the largest duplication software and services company in the world. With the largest staff of field salespeople

and customer managers. And doing business with a single, reliable company such as

D&B Software, with the full backing of The Dun & Bradstreet Corporation, will allow customers to do something they've always wanted to do. To concern themselves less with their software and

more with the business at hand. D&B Software. The happy result of a merger. And living proof that when two become one, extraordinary things can happen.

For more information about a most welcome addition to the world of software, call (800) 239-INFO.

**Occasionally, Mergers Produce Results That Either Party  
Would Find Impossible To Produce On Their Own.**

**D&B SOFTWARE**